Illinois U Library

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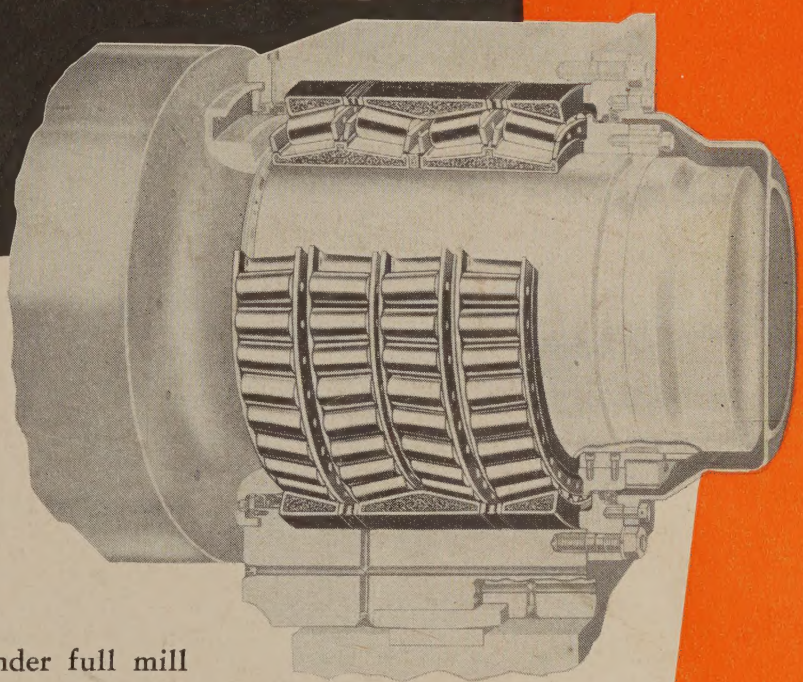
White Speaks on Scrap—p. 115
Builders Meet—p. 118

The IRON AGE

NOVEMBER 27, 1947

STOP-GO

WITHOUT LOSS OF TIME OR MATERIAL!



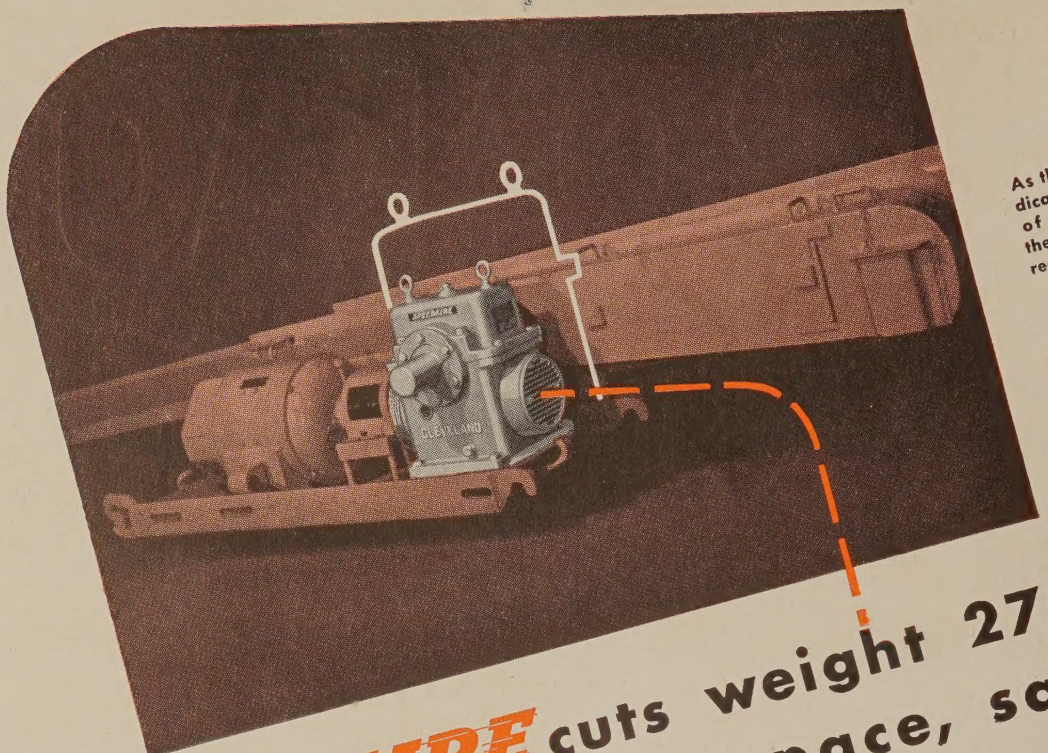
Routine mill stoppages present no difficulties where Timken Roll Neck Bearings are used. It is not necessary to relieve roll pressure when re-starting, therefore no material is wasted and no production time lost.

Roller bearings respond instantly under full mill load because they are *true anti-friction bearings*. Thus the momentary absence of a film of lubricant between the contact surfaces in the load zone does not affect their free-rolling characteristics. They would start just as quickly and easily under load if they were bone dry. This cannot be said of other types of roll neck bearings.

There is now no need to pass up this important roller bearing advantage—since Timken Balanced Proportion Bearings add 50% to 60% to the maximum neck strength afforded by earlier designs of roller bearings. For specific application data consult your mill builder or Timken roll neck bearing engineers. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROLL NECK BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION



As the white outline indicates, a standard unit of more than double the frame size would be required to do the work of Speedaire.

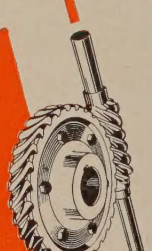
SPEEDAIRE cuts weight 275 lbs., takes 53% less space, saves $130

SPEEDAIRE enabled the builder of this portable mine conveyor to materially reduce the dead weight of his equipment. The speed reducer itself weighs 275 pounds less than a conventional worm gear unit of equivalent capacity. And because Speedaire occupies 53% less space, a further substantial reduction was effected in the size and weight of the base on which motor, drive and conveyor are mounted. An initial cost saving of $130 also was realized with Speedaire.

Speedaire is Cleveland's new fan-cooled worm-gear speed reducer. Because it is fan-cooled, Speedaire will do more work—will deliver up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantages of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Clevelands.

Send for Catalog 300 for a full description. The Cleveland Worm & Gear Company, 3252 East 80th Street, Cleveland 4, Ohio.

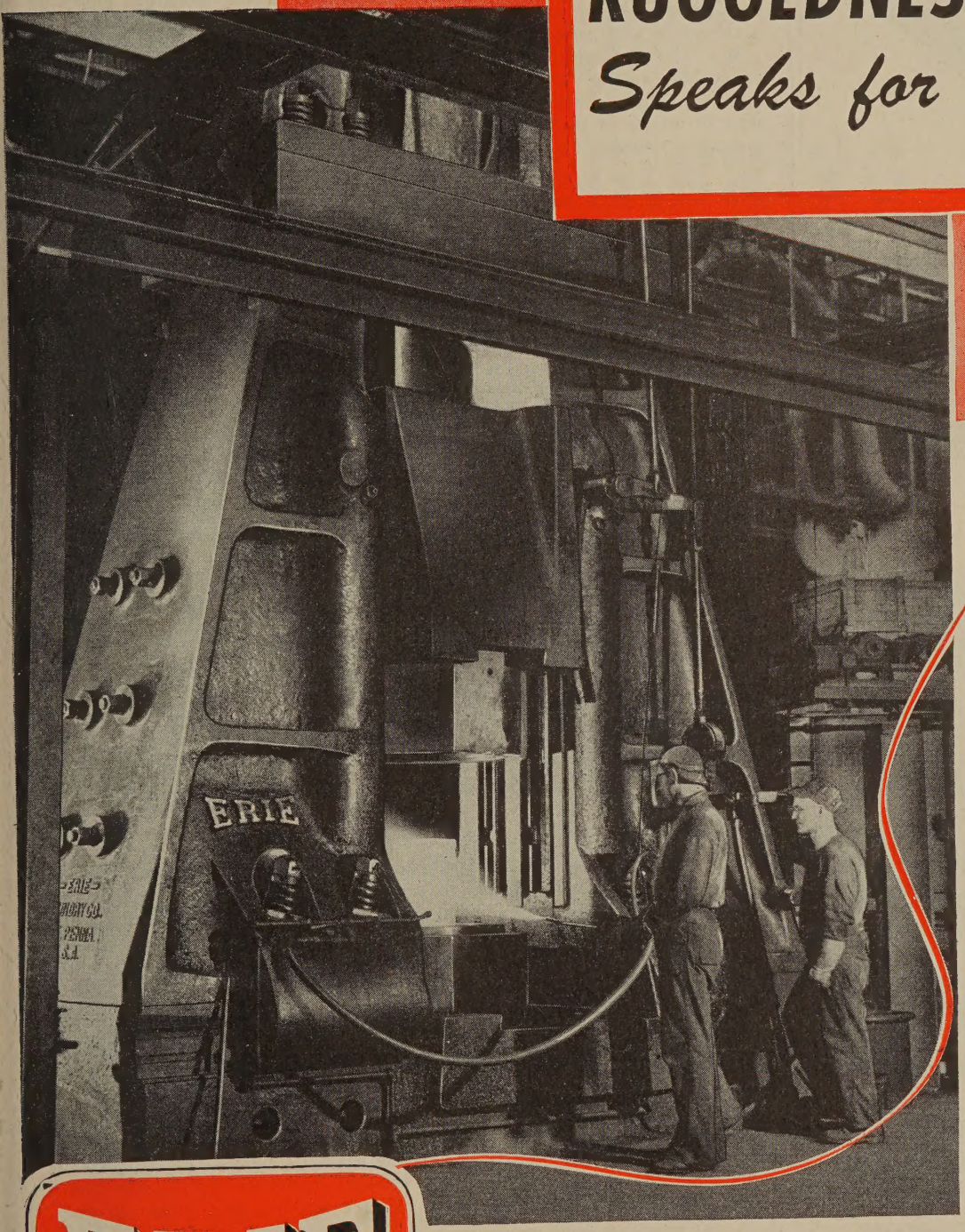
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



CLEVELAND
Worm Gear
Speed Reducers

THE IRON AGE, published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class ma Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Wes Hemisphere Countries $15; other Foreign Countries $20 per year. Single Copies 35¢. Annual Review Number, $2.00. Vol. 160, No. 22.

ERIE HAMMERS *are Built with* RUGGEDNESS *that Speaks for Itself*



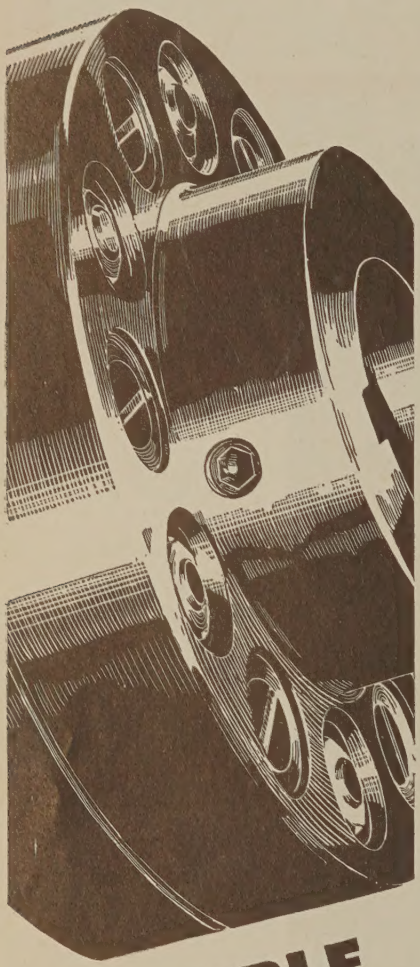
ERIE

For full details write for Bulletin 340

ERIE FOUNDRY COMPANY · *Erie, Pa., U. S. A.*

ERIE BUILDS *Dependable* **HAMMERS**

AJAX



FLEXIBLE COUPLINGS

Protect direct-connected machines from unavoidable misalignment. No lubrication, no noise. Write for data book.

AJAX FLEXIBLE COUPLING CO. INC. WESTFIELD, NEW YORK

Fatigue Cracks

BY C. T. POST

Hucksters?

• • Since the book and movie, "The Hucksters", portrayed advertising as lolling in the libidinous lap of luxury, most of the agency men we know have concentrated on a sackcloth and ashes routine.

But The Hucksters fooled a lot of people, among them a Florida landlord who chose *Advertising Age* in which to place the following advertisement:

PENT HOUSE APARTMENT — AVAILABLE THROUGH THE WINTER SEASON

"The only facility on Fort Lauderdale beach offering luxurious, true pent house living. Ideal for entertaining customers or key executives in your organization in need of relaxation and a trip to tropical Florida. 34 x 22 foot living room with 13 foot bar concealed behind modernfold panels . . . Two sun decks, two large balconies overlooking Atlantic Ocean and Intracoastal waterway. Custom furnished throughout by interior decorator. November through April rental $12,000; January through April, $10,000 . . . Write today to ————."

Heretofore, we'd always thought of the advertising agency boys as a pretty solid, hard-working crew. If we'd been *Adverting Age*, for the sake of the profession's reputation we'd have turned that ad down faster than the *Christian Science Monitor* rejecting a reading notice for Dr. Quince's Indian Bile Rejuvenator.

Trust

• • We've just uncovered a fine example of what happens to people who don't believe what they read in your favorite family journal. It ranks as one of the biggest blunders of all time—and yet with a little more attention to the news section of your f.f.j. the result might have been different. (Just how different we'd rather not consider). Kathleen McLaughlin, writing in *The New York Times* under a Nov. 7 Munich dateline shows how the Nazis underestimated U. S. war potential. She concludes: "When Dr. Ritter reminded him (Ribbentrop) that United States steel production, as reported over a period of years in IRON AGE, must in 1942 approximate 70 million tons, Ribbentrop again laughed at him, declaring that during the "Thirties" it was only 56 million tons."

Gray Market

• • Any day now you can look for a special joint meeting of Congressional committees investigating, respectively, the housing shortage and the gray market in steel.

Miss Roberts, eagle eye of the Chicago office, reports a recent agony advertisement in the "Apartments Wanted" column of the Chicago Tribune placed by a steel executive. *Bonus offered:* Guaranteed supply of steel to anyone coming through with an apartment.

That one should be a steal for an outfit dabbling in prefabricated housing.

Word of Mouth

• • One thing that never ceases to amaze is the ability of the country's scholars to make two words bloom where one grew before. At the risk of establishing a scientific law to be passed down to posterity in the technical handbooks, we'd say that ponderousness of expression is in direct proportion to the number of academic degrees.

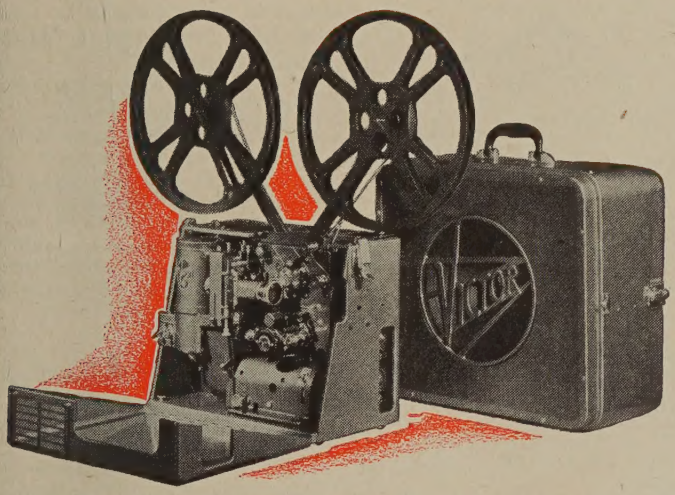
For instance, looking through the sports news, we came across a comment of the president of one of the country's great universities on a report that the football coach would resign. If the coach, himself, had been asked, he probably would have said, "I ain't quittin' "—which would have rammed the thought straight home to his worshipful public. But the university president threw a curve: "I have had no resignation, oral or verbal, from ————."

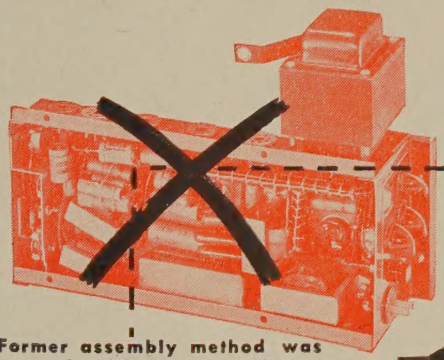
There's a fine line of distinction, we learn from our Webster Unabridged, between *oral* and *verbal.* Oral applies only to that spoken by word of mouth. Verbal "strictly applies to that which is communicated in words, either spoken or written, or to that which has to do with words in contradistinction to ideas." In other words, the coach didn't say he was going to quit, and if he was thinking about it, he didn't let on. That's the best we can do with a grammar school diploma.

Next season, after the faculty gets another round of honorary degrees, they'll be selling dictionaries at the stadium gates along with souvenir programs. Football is a great thing for education.

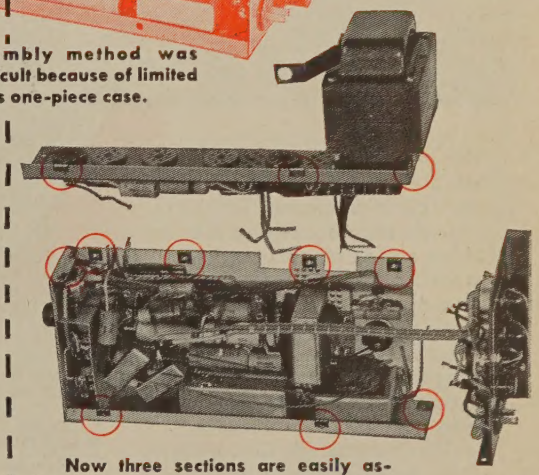
"WE DO FIND THAT WE HAVE REDUCED OUR ASSEMBLY COST APPROXIMATELY 36% ON THIS UNIT SINCE BEGINNING TO USE THE TINNERMAN SPEED NUT"

This is a direct quotation from a letter from A. S. Webeck, Works Manager of the Victor Animatograph Corporation, Davenport, Iowa, makers of 16 MM sound motion picture equipment.





Former assembly method was extremely difficult because of limited confines of this one-piece case.



Now three sections are easily assembled separately, and quickly fastened together with SPEED NUTS into completed unit.

SPEED NUTS always effect substantial savings in assembly cost, but here is a case of unusually high savings.

Victor Animatograph Corporation accepted our suggestions on the assembly of their amplifier unit. They discarded their time-consuming practice of assembling a myriad of small parts in a crowded case. Now the amplifier is assembled in three easy-to-get-at sections that are quickly fastened together with SPEED NUTS to complete the unit.

Assembler training time is cut from two months to a few hours. Assembly time is slashed, employee morale improved, and with three assembly lines instead of one, the risk of complete production stoppage due to shortage of one or two parts is avoided.

Let us demonstrate what SPEED NUTS can accomplish in improving the assembly of your product.

TINNERMAN PRODUCTS, INC.
2040 FULTON ROAD • CLEVELAND 13, OHIO

In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aerocessories, Ltd., London
In France: Aerocessoires Simmonds, S. A., Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

Speed Nuts*
PATENTED
MORE THAN 4000 SHAPES AND SIZES
* Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS

The merger of American Spiral Spring & Mfg. Co., and Fort Pitt Spring Co. has brought together two of the oldest spring manufacturers to form one of the *largest* spring producers in the country. This combined equipment and experience offers exceptionally complete facilities for the manufacture of all types of springs, from heavy coil and elliptic springs for cars and locomotives, to the smallest helical wire and flat springs for all purposes. Our engineering facilities are at your disposal to help solve your intricate spring problems.

PORTER-BUILT means BETTER-BUILT

American-Fort Pitt Spring Division
H. K. PORTER COMPANY, Inc.
PITTSBURGH 22, PENNSYLVANIA
District Offices in Principal Cities

Dear Editor:

NEEDED IN BERLIN

Sir:

Twenty years ago I made a journey to the U.S.A. for studying purposes and by this I got knowledge of your technical journal THE IRON AGE. As engineer and constructor I am very much interested in technical progress in the U. S. A. and would be obliged to you if you would send me a few specimens of your magazine. I should be glad if you could form a connection for me with a firm of my branch of industry (heating and ventilating equipment) in your country with which I could correspond as engineer and expert. At the same time I should be obliged if you could procure for me a cos measuring instrument which I urgently need for my electric research laboratory. Please forward my enclosed letter to a special factory for the purpose of making an offer. I have to apply abroad to purchase this instrument as at present in Germany there is no firm which is manufacturing this article.

HERMANN MULLER
Berlin

● We are sending two recent issues of The Iron Age as requested. We suggest you write to the American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York, explaining your desire to start a correspondence. Your request for what is known in the U. S. as a phase angle meter has been forwarded to a producer of such instruments.—Ed.

THE WHEAT AND THE CHAFF

Sir:

Congratulations on your enlightened editorials. I particularly liked the one of October 9, entitled "The Wheat and The Chaff."

DONALD REHM
Chicago

MIDGET BALL BEARINGS

Sir:

Can you inform us of the name of the manufacturer of plastic ball bearings carrying the trade mark, "Midget." The plastic material of which they are made carries the name of Bakelite Corp.

A. DULMO
Societe Anonyme Des Usines Chausson
Asnieres S/Seine, France

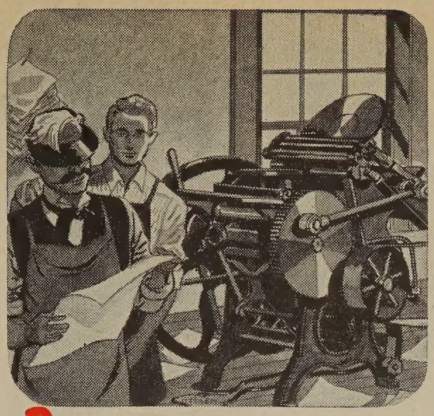
● Neither Bakelite Corp. nor our staff are able to identify the manufacturer of these ball bearings. Can any of our readers help?—Ed.

EXCESS CAPACITY

Sir:

We are writing to find out if you know of any firm or firms which make a business of getting work for production shops. We have a die casting, stamping, polishing and plating shop and have excess capacity. We are

1 **1450**—First printing presses stemmed from cheese or cider presses. Gutenberg's hand press used type carved from wood and metal. Four centuries later printing was still largely a manual operation. But the Industrial Revolution was near.



2 **1875-95**—Electric power revolutionized printing. Hand work gave way to powered presses and machines. Foot treadles and hand cranks disappeared. Low cost electricity started printing on its way to becoming a modern art.

3 **1930**—Whereas, Gutenberg was 7 years printing 200 copies of his Bible—presses of the thirties did the job in 20 minutes! In 1915 Howell "Red Band" motors were introduced. They won instant acclaim in this and other industries.

"Printed in U. S. A."—and how!

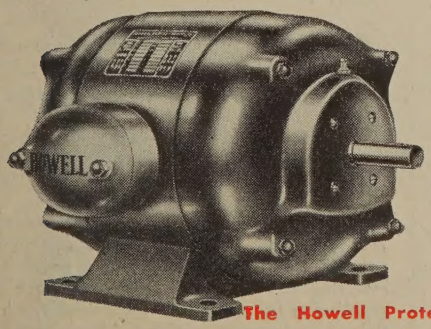
4 **Today**—"Printed in U.S.A." means superiority in inks, paper, type, presses and printing ideas and techniques.

In printing, a billion-dollar industry, Howell Motors power presses, linotype, monotype machines the country over. In other industries, too, they're an important source of power for pumps, conveyors, fans and machine tools.

Precision-built of the finest materials, these rugged, industrial-type motors can, and do, take on the toughest jobs.

Are *you* using Howell Motors?

Here's another precision-built Howell Motor . . . industrial type with copper or bronze rotors . . . specially insulated . . . statically and dynamically balanced.

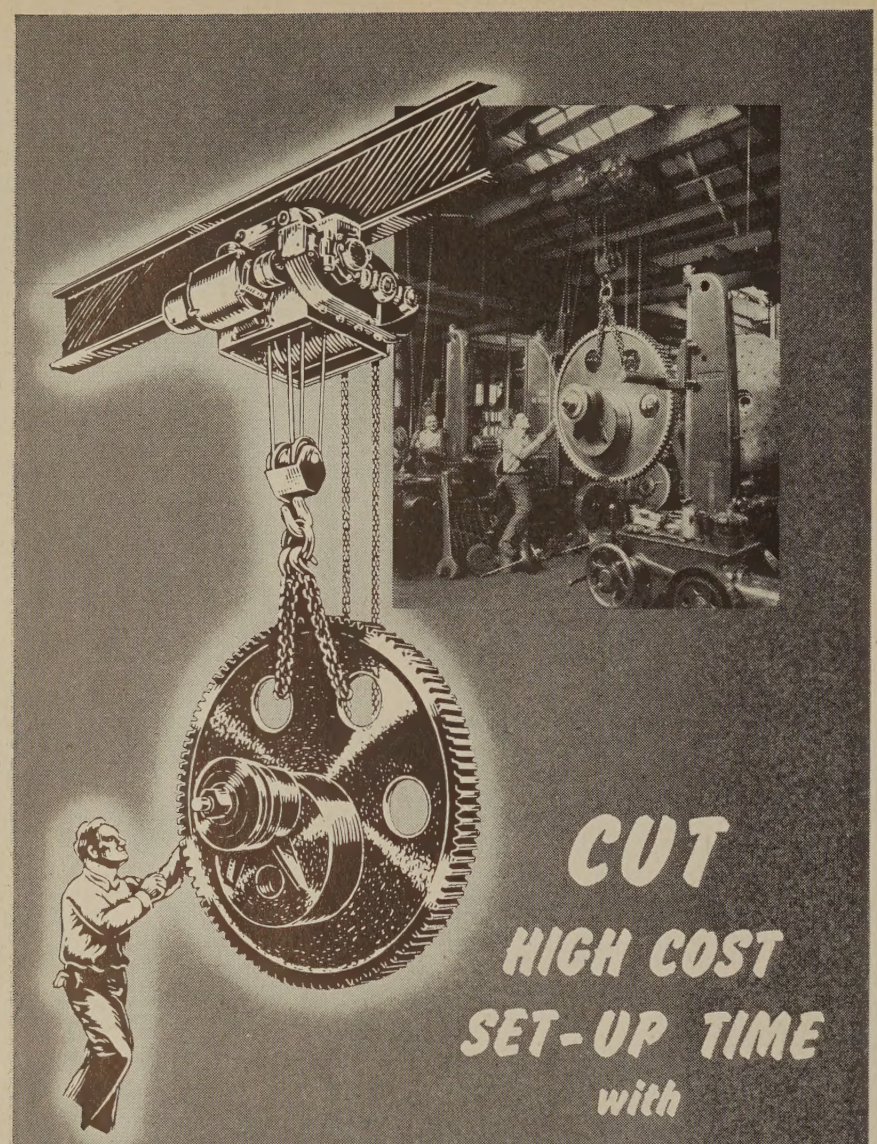


The Howell Protected Type Motors

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Manufacturers of Quality Industrial Type Motors Since 1915



platers of aluminum in either stamping, extrusions, or die casting. . . .

RICHARD CAMP
Camp Mfg. & Sales Co.
Tacoma, Wash.

● There are a number of representatives of firms who handle accounts for processing services, but so far as we know, there is no list available. Most of these representatives are manufacturers' representatives, handling services as well as products. See THE IRON AGE classified sections which contain advertisements for the type of firm in which you are interested.—Ed.

PRESSED METALLIC POWDER

Sir:

Can you furnish us with the name and address of companies making castings from pressed metallic powder?

I. W. SPRINK
President
Motor Iron Parts Co.
Whitehouse, Ohio

● A list of companies is being mailed.—Ed.

SPOT TESTS

Sir:

In the Oct. 23 issue on p. 40 you publish an article on spot tests for steel which describes tests for chromium, silicon, nickel and manganese. Your article advises that you published a similar article on spot tests for molybdenum in the Oct. 3, 1946, issue, p. 41. We would like to secure a copy of this article together with a copy of "Quick Methods for Identifying Metals" in the Oct. 17, 1946 issue, p. 58.

H. E. NEELY
Manager, Fittings Div.
John B. Astell & Co., Inc.
New York

GREATER OUTPUT

Sir:

May we have your permission to reprint the article "For Sale—Greater Output per Dollar," by L. D. McDonald of Warner & Swasey Co., in the Aug. 21 issue, for distribution to our supervisory staff? Proper credit will be given.

HARRY S. WARD
Cost Advisor
American Rolling Mill Co.
Middletown, Ohio.

● Permission granted.—Ed.

ELECTROLYTIC POLISHING

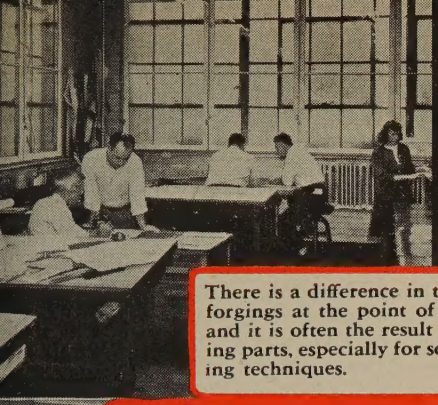
Sir:

We understand that an article on the Jacquet process of electrolytic polishing has appeared recently in your magazine. We would be obliged to you if you would give us the dates of issue.

A. A. BROOKS
Thermodynamic Engineer
Worthington Pump & Machinery Corp.
Wellsville, N. Y.

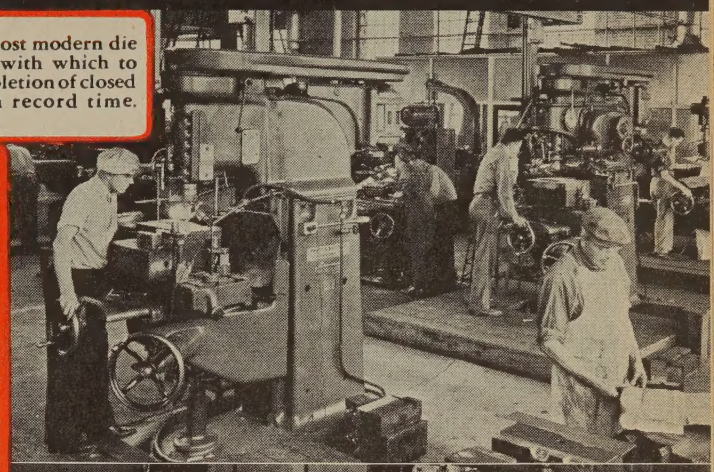
● No article by Jacquet has appeared in The Iron Age. However, there are several articles on electrolytic polishing which have referred to Jacquet's work. We are forwarding a list of these. Incidentally, an article by Jacquet entitled "Principles and

To Relieve You Of Forging Production Grief



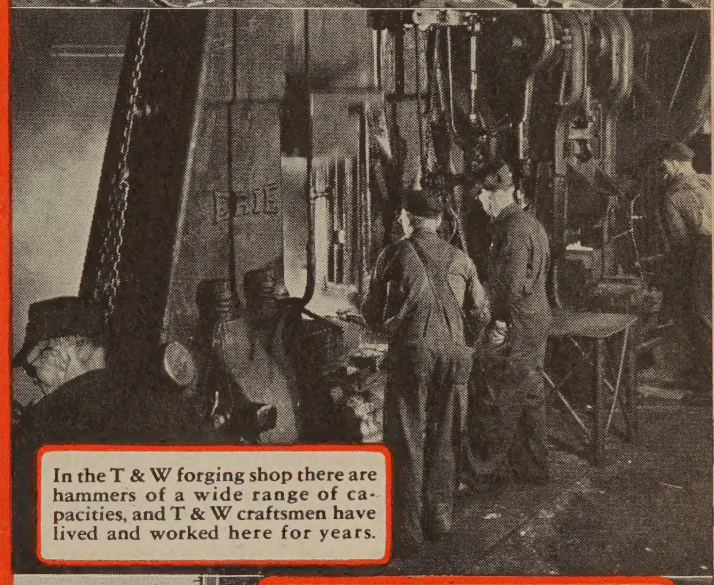
There is a difference in the cost of forgings at the point of assembly, and it is often the result of designing parts, especially for sound forging techniques.

T & W utilizes the most modern die making equipment with which to accomplish the completion of closed impression dies in record time.



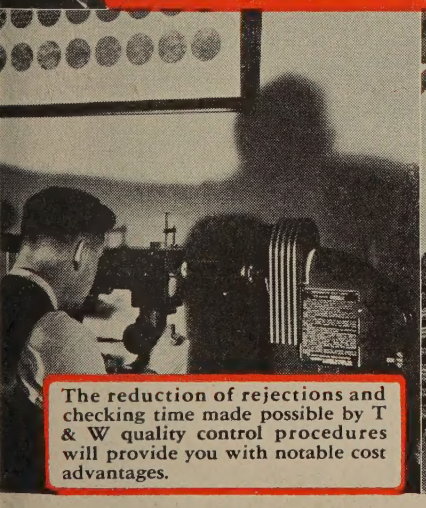
A wide range of experience and a wide variety of forging facilities permits the correct combination and coordination of facilities and craftsmen to meet the specific requirements of each part. T & W forging service is a straight-forward production process that encompasses every step and stage and brings under strict control every element of cost and quality. Ask a T & W Forging Engineer to explain how T & W facilities may be used to reduce the cost of forgings at the point of assembly.

T&W FORGINGS USUALLY COST LESS AT THE POINT OF ASSEMBLY

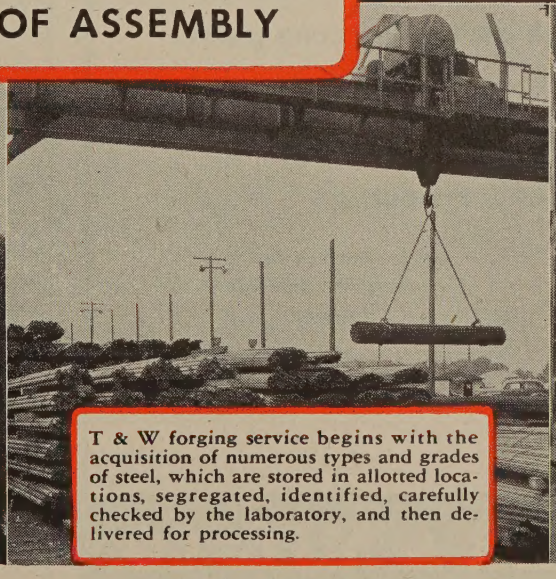


In the T & W forging shop there are hammers of a wide range of capacities, and T & W craftsmen have lived and worked here for years.

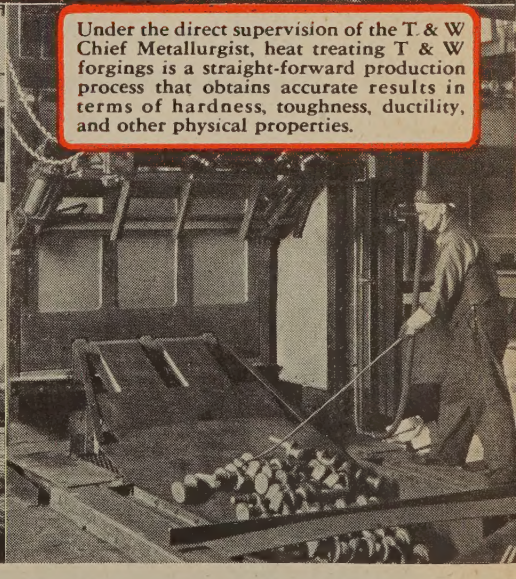
Under the direct supervision of the T & W Chief Metallurgist, heat treating T & W forgings is a straight-forward production process that obtains accurate results in terms of hardness, toughness, ductility, and other physical properties.



The reduction of rejections and checking time made possible by T & W quality control procedures will provide you with notable cost advantages.



T & W forging service begins with the acquisition of numerous types and grades of steel, which are stored in allotted locations, segregated, identified, carefully checked by the laboratory, and then delivered for processing.

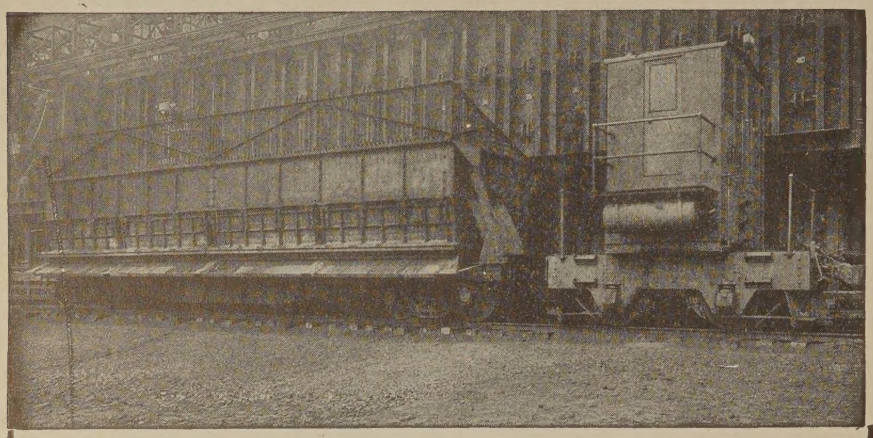


TRANSUE & WILLIAMS

STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

COKE OVEN EQUIPMENT



QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

Other ATLAS Products

Ore Transfer Cars
•
Scale Charging Cars
•
Electrically Operated Cars for Every Haulage Purpose

Locomotives for Switching and Interplant Haulage
•
Turntables

The ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1100 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Scientific Applications of the Electrolytic Polishing of Metals" is appearing in the October 1947 issue of *Sheet Metal Industries* of London.—Ed.

SHOVEL HANDLES

Sir:

Just in case you have not had responses to the inquiry relating to shovel handles, which appeared in Dear Editor of the Oct. 23 issue, I am forwarding a late answer. It would seem that there is probably no criticism of the production method involved. However, I think your correspondent has stated the problem incorrectly. I would be very much surprised to learn that we put a double bend in long *oak* shovel handles. I believe his investigation will indicate that we put the double bend in either long, white ash, hickory, or, in some cases, American elm shovel handles. There is probably no species that would prove more unsatisfactory for the application—just a poor choice of "grade." I believe an exact opinion and the scientific names of the recommended kinds of wood for this job could be obtained by writing to the Extension Dept., New York State College of Forestry, Syracuse University, Syracuse, N. Y. If this has been of some assistance I should like to assure you it is indeed a poor help for the inestimable aid that THE IRON AGE gives.

BAYARD BIGELOW, JR.
Hartford, Conn.

● Thank you for your comments, Reader Bigelow. We are forwarding your suggestions to F. H. Crawford & Co., Inc., which presented the problem.—Ed.

SPOTWELD ANALYZER

Sir:

We would appreciate receiving a copy of the article "Spotweld Analyzer for Maintenance Work" by D. F. Hays, appearing in the June 12 issue, pp. 49-51 . . .

H. A. STEEL
Administrative Engineer
McDonnel Aircraft Corp.
St. Louis

SHIM STOCK

Sir:

We are desirous of learning the names of mills that roll shim stock.

S. ULRICH
Brickman Stamping Co.
Oshkosh, Wis.

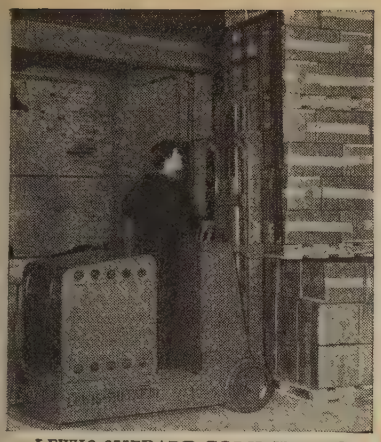
COKE GRADES

Sir:

Is there any printed matter available showing information on the various grades and sizes of coke. . . . Any information that you can give us would be appreciated.

M. C. NESS
Asst. General Purchasing Agent
American Chain & Cable Co., Inc.
Bridgeport

● American Society for Testing Materials, 1916 Race St., Philadelphia, publishes a compilation of thirty standards of various



LEWIS-SHEPARD FORK TRUCK

DEPENDABLE POWER

EXIDE-IRONCLAD POWER AND BATTERY ELECTRIC TRUCKS

The efficient, cost-cutting team that speeds materials handling

You gain all along the line when your materials are handled by electric trucks and Exide-Ironclad Battery Power. This modern efficiency team keeps goods moving in greater volume, and saves time and money all day long.

Exide-Ironclad Batteries are preferred for electric truck service because of their great power and dependability . . . a result of special Exide-Ironclad construction, which is unlike that of any other battery.

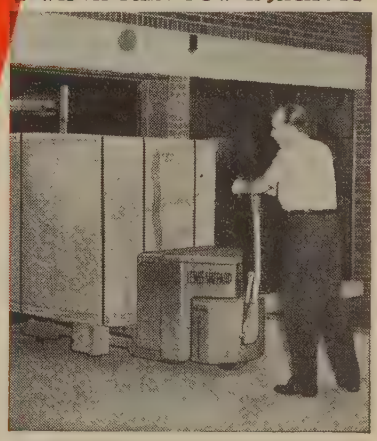
One important Exide-Ironclad feature is the positive plate which consists of slotted tubes containing the active material. So tiny are these slots that, while permitting easy access of the electrolyte, they prevent the active material from readily washing away. The results are high power ability, longer life, greater economy and safety.

Write us for a FREE copy of Exide-Ironclad Topics which contains "Case Studies" of material handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

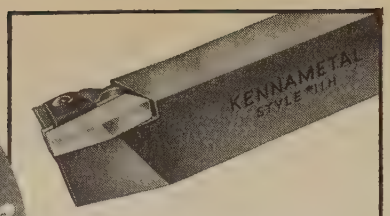
THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32

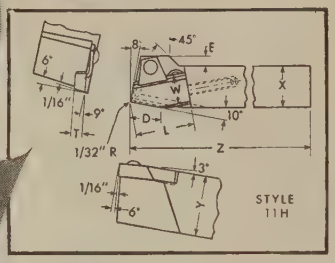
Exide Batteries of Canada, Limited, Toronto

LEWIS-SHEPARD POWER JACKLIFT



If Interrupted Cuts Are Your Problem Learn About KENNAMETAL





Style 11H is one of a complete line of Kennametal tools, having sturdy, clamped-in, advanceable Kennametal tips. This assembly — developed by Kennametal — is highly successful on interrupted cutting, and is equally outstanding on continuous-cut operations. It utilizes Kennametal's high strength to best advantage—provides a thermally-strain-free assembly; makes possible deep cuts and heavy feeds; simplifies grinding since tip is advanced and resharpened without removing any steel from shank; and enables practically all of the Kennametal tip to be utilized for cutting.

You're probably enjoying the advantages of carbide tooling on continuous-cut operations—but how about interrupted cutting?

Has this given you tool trouble, and made you resort to slower machining methods on some important jobs?

If so, Kennametal will help you solve this problem. Its ability to withstand the shock of interrupted cuts, on both cast iron and steel, has been unequalled.*

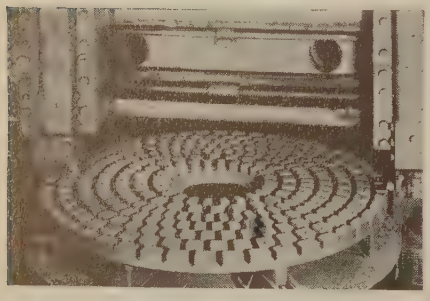
Although cutting conditions are often improved by changing the tool shape so that the shock will be imposed on a section of the tip that is stronger and better supported, it is still the carbide that must take the punishment. Here's where Kennametal has a distinct advantage.

Because of exclusive processing methods and careful control in manufacture Kennametal's impact strength is unusually high for such a hard material—as great as that of hardened alloy steels having much lower hardness and compressive strength.

Still further advantages for interrupted cutting are obtained by the use of mechanically-held tools developed by Kennametal Inc. Tips of characteristically high impact strength are securely clamped to, and firmly supported by a heat-treated steel shank, to provide an exceptionally strong, strain-free assembly

If you have had difficulty with carbide tools on interrupted cuts, let us engineer Kennametal to the solution of your particular problem.

** Ask us to send you a set of Performance Reports that demonstrate the superior results obtained with Kennametal Tools on interrupted cutting.*



This iron casting has 288 chilled lump interruptions. A Kennametal standard Style 11T80 tool faces and turns it at 190 ft./min., .048" feed, and 1/4" depth of cut.

Kennametal bores, turns, and faces over interruptions and sand holes on this chrome-nickel steel rack pinion. Speed—155 ft./min.; feed—.032"; depth of cut—1/4" to 5/16". Performance is 5 to 1 over high speed steel tools in production and pieces per grind.

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Sir:

It would be appreciated if you can supply me with the names of companies engaged in the manufacturing of equipment used in the "lost wax" process of precision casting. I am a veteran air-man interested in establishing myself in a business of my own . . . If there are companies in the Detroit area, it would be particularly advantageous for me to know of them.

PAUL S. SHAUGHNESSY
Windsor, Ont.

● Names of precision casting equipment manufacturers are being sent.—Ed.

THE PIPE STORY

Sir:

Do you have any reprints of the pipe story entitled "Wanted — Six Million Tons of Steel," which appeared in the Oct. 9 issue? If so, could I have one or two copies?

JOHN L. YOUNG
Vice-President
National Tube Co.
Pittsburgh

THERMITE CUTTING

Sir:

We understand that there has been tried a new method of cutting steel through the use of thermite powder. We would appreciate any reference you might give us so we might get this information.

BERNARD SCHAENEN
Commercial Metals Co., Ltd.
Dallas

● Write to Metal & Thermit Corp., 120 Broadway, New York.—Ed.

TECHNICAL MANPOWER

Sir:

I have just read your article, "Predicts a Shortage of Technical Manpower into 1949 or 1950," p. 208, Oct. 16 issue. I should like to get additional information on the apprenticeship training that Westinghouse has to offer to young men of high school training. I would appreciate any information as to what specialized engineering fields from which Westinghouse selects their engineers.

FRANK S. MARTIN
Chanute Field, Ill.

● Write to Mr. H. N. Muller, manager of the Educational Dept., Westinghouse Electric Corp., Pittsburgh 30, Pa.—Ed.

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Sir:

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The IRON AGE

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Weighing the Cost

ON November 18 the President of the United States addressed a joint session of Congress. The message purported to be a program for European aid. Actually, it was a program for shackling the American economy. British comment labeled the President's approach "bold." It was also shocking.

The message, as everyone knows, had its origin in the failure of Europe to achieve hoped-for targets of postwar recovery—nineteen billion American dollars already granted notwithstanding. This recovery presumably would immunize Europe against further inroads of Soviet power, which is also a menace to our own security.

The foregoing premise, i.e., that in helping Europe we help ourselves, is accepted by Democrats and Republicans. However, there is sharp dispute over the price to be paid for this assumed advantage. It is by no means certain that the projected aid will strengthen Europe. It may serve merely to sustain tottering left-wing regimes. It may delay the salutary exposé of planning fallacies. It may defer the vigorous self-treatment for which Marshall appealed in his Harvard speech.

The sixteen nation Paris Conference report nowhere pledges even indirectly that the members, fortified by four years of American aid, will resist Communism. Nor does that report by the expected beneficiaries of American aid anywhere imply that they would align themselves on our side in the event of conflict with Russia. That is merely the earnest hope of those who now urge American help on a prodigious scale.

What we are dealing with here is not a solid *quid pro quo* in a hard-headed covenant between mature, honorable and sophisticated parties, but rather an amorphous mixture of charity, self-interest and quixotic uplift. Sometimes it is hard to tell whether our boys are practical negotiators or knights in shining armor on white chargers, prepared to joust for the good, the true and the beautiful.

However, there is no doubt about the price we are asked to pay. Immediately, it is a matter of $597 million for stop-gap aid to Austria, Italy and France. In the longer four-year period, it may average five billion a year. This, as the President disclosed, is only part of the price. Therein lies the shock. Not only is the American taxpayer asked to chip in approximately $500 apiece; he is asked to delegate to the Federal Government—and in this instance it means the Chief Executive—all the discretionary, total power over our economy which a great war seemed to require.

The saving assurance that the power demanded will be exercised sparingly; that only articles in short supply will be rationed, that only a few, selected, vital commodities not specified will be controlled—such assurance may be accepted with the cynicism born of recent American and current European experience. Partial regimentation is to economics what suspended pregnancy is to biology. Both are inexorable processes which cannot be stayed, short of their natural consummation.

In considering relief to Europe, it may be well to weigh the total, the ultimate cost, and not alone the first obvious installment in dollars.

Joseph Stagg Lawrence

Inland's "Men of Steel"

These are typical steelmen who make your Inland steel. Competent, self-reliant, experienced men, they have devoted their lives to steelmaking. You'll find them everywhere in Inland's plants . . . on the ore docks . . . tapping blast furnaces . . . charging open hearths . . . supervising rolling operations . . . running tests in Inland laboratories. All are working to a common purpose . . . to produce steel of the highest quality—steels they can be proud of. It is men such as these . . . Inland's "men of steel" . . . who make the steel you can depend on.

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► Most steel companies actually would not have the money available to take care of any substantial increase to ingot capacity. Repairs and renovations alone are causing headaches--it would be easy to say that steel mills are operating on borrowed equipment.

► Stainless clad bumpers will probably appear on some trucks and buses next year. Their application to passenger cars is a matter of price--chromium is now cheaper in large runs. But if electro or mechanical polishing can be developed for the job their initial cost would likely be less than the chrome plated article.

► The conversion of British steel melting furnaces to oil is continuing--allowing 3 tons of oil to do the work of 5 tons of coal. Production of 4 million tons of coal a week in Britain is still only 80 pct of domestic requirements.

► It appears certain that the steel union will seek higher wages next April. The recent clothing wage increase is a straw in the wind. With the country already price conscious, this demand will be a tough hurdle for the steel companies. But if no agreement is reached, the old contract is good for another year.

► One of the smaller midwestern steel producers last week notified all their customers they would have no more hot rolled sheet or strip to sell for the next two years.

► Steel consumers leaning on conversion deals for their supplies, and unable to pick up sheets are buying hot rolled strip rolled to the gage and width they require. They then take the coils to a smaller plant which can decoil, roller level, and shear to sheet size. For this operation the three processors in Chicago charge from $12 to $19 per ton.

► Sweden recently sent a consignment of 50,000 metric tons of iron ore to Germany, said to be the first shipment since the war ended. It will be used in connection with an order for rolled products for Holland. German steel circles express the hope that the military government officials will soon approve imports for German uses.

► An engineer of a large eastern steel producing company asserts that for carbon reduction from 0.12 to 0.15 carbon on down--in the openhearth--compressed air has given as rapid a rate in carbon removal as does pure oxygen. Close chemical checks reveal no abnormal nitrogen pickup in the steel.

► This year, coal is supplying 47 pct of the energy used by industry in the U. S., oil 30 pct, natural gas 12 pct, and hydro-electric power 11 pct. These figures compare with World War I statistics when coal supplied 80 pct, oil 12 pct, natural gas 4 pct, and hydro-electric power 4 pct.

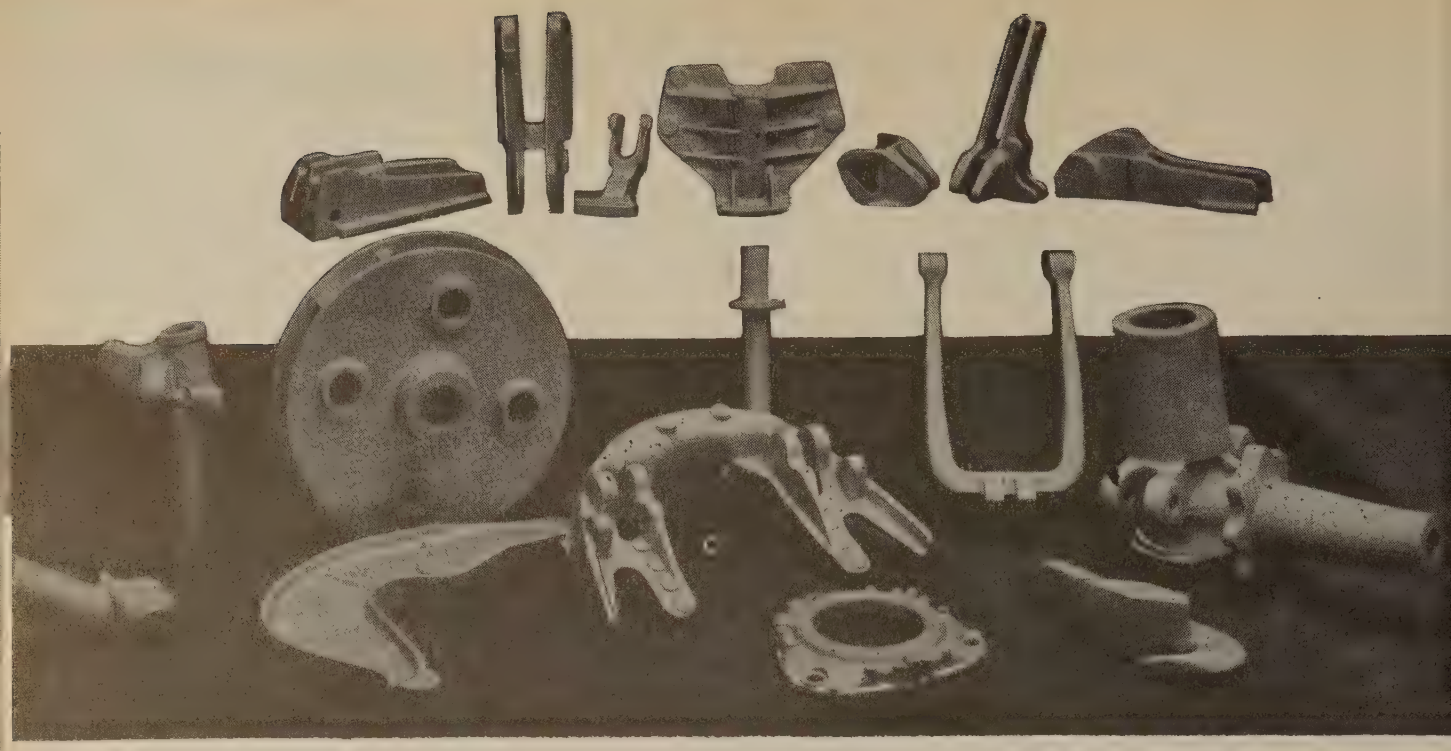
► Washington chatter on prospective price increases will make it tough for the steel companies to increase their tinplate prices as planned. Tinplate prices go up only at year end as sales are on yearly contract basis.

Most companies are finding their return on tinplate somewhat below normal, and the substantial increases predicted in The Iron Age are a foregone conclusion unless Washington pressure becomes unbearable.

► Prominent automobile engineers express the opinion that only a few of the present automotive applications for high tensile steel will survive the return to normal steel supply conditions.

► Electric motors and controls deliveries have improved sharply in the past year. Integral hp motors now range from stock up to 15 months delivery, the latter figure being for large mill motors. Fractional hp units are generally down to 6 to 9 months, but deliveries are generally reported to be keeping up with consumers' schedules.

Some standard controls may now be bought from stock; many can be had in 10 weeks. Where engineering is required, delivery times run from 6 months to 1 year.



CENTRIFUGALLY cast heat resisting alloy components for British gas turbine engines of various types.

Why Cast Steel

By J. F. B. JACKSON
Chief Metallurgist and Technical Controller, Foundries
David Brown & Sons, Ltd., Huddersfield, England

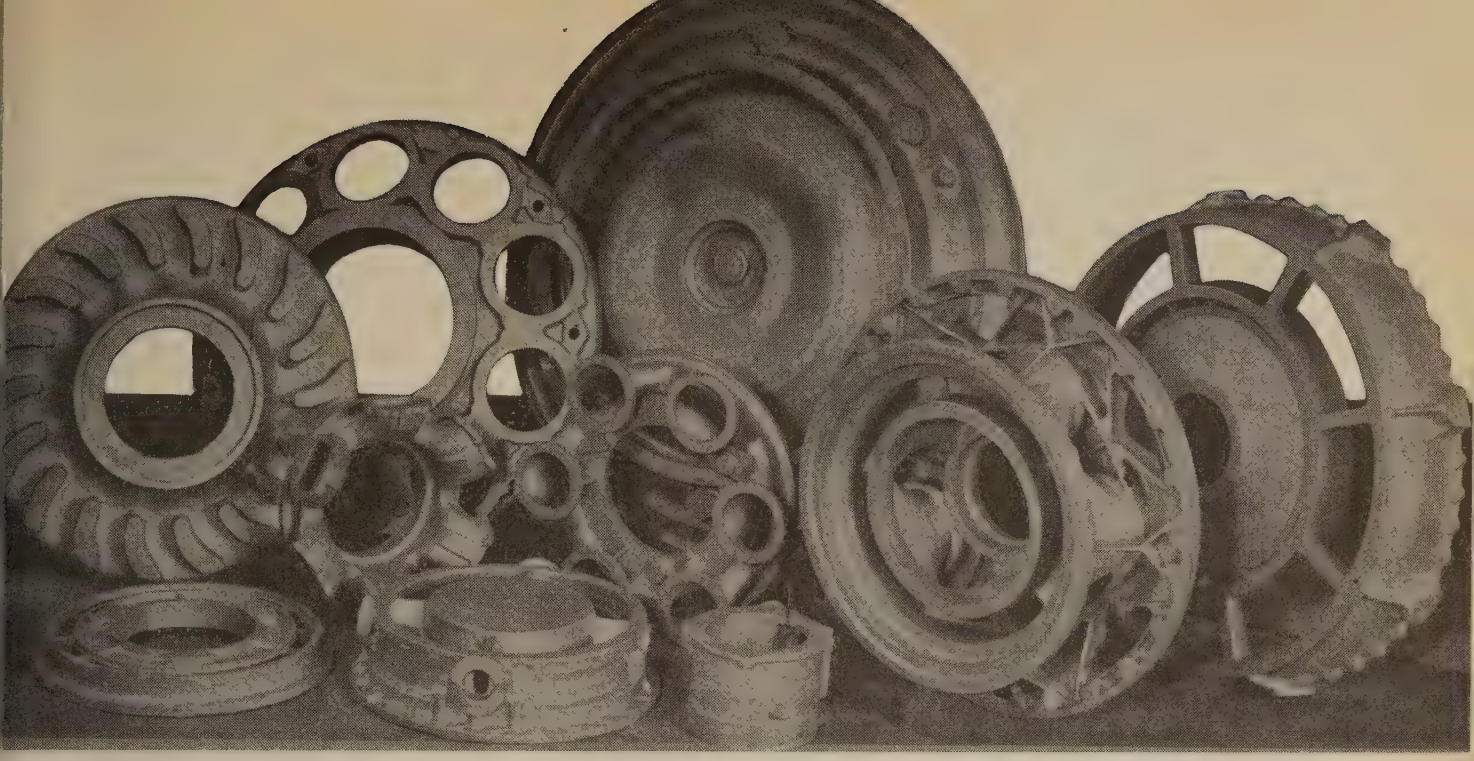
o o o

MUCH has already been written and published upon the centrifugal casting of steel, particularly with reference as to how it is done and to the advantages that accrue from such practice. Less has been said, however, of the limitations of the process. It has been suggested that, for the benefit of intending centrifugal steel founders, a statement which bore reference to both sides of the story would be of value. Such a statement might at the same time help towards a more balanced assessment of the proper importance of centrifugal casting in the general scheme of foundry operations and in relation to normal static casting methods in particular.

It has been the case with a number of manufacturing or process developments that overenthusiasm during their early stages has led to a rush to adopt the technique and to attach to it more magic than it does in fact possess. Such resultant widespread application, without regard to the inherent limitations of the technique or the product, has only too frequently led to subsequent wholesale condemnation. This means in effect that the process, whatever it may be, is ultimately decried solely because it has certain limitations, whereas it would obviously have been much more rational to recognize these limitations and yet fully exploit the advantages.

Opinion will vary as to the extent to which these remarks apply to the centrifugal casting process in steel foundries. There is no doubt, however, that a number of firms producing steel castings embarked upon the installation of centrifugal casting plants within the last 10 years, expecting to introduce an answer to the majority of their defective casting problems and have at their disposal a process of outstanding operating economy.

When it was found in fact that neither of these desirables resulted to an unqualified extent, there is equally no doubt that more than a few of the foundries concerned were about as quick to drop the process as they had been to pick it up. There will in all probability be steel founders at the present time seriously considering the introduction of centrifugal casting equipment and it is suggested that, while in the majority of foundries the process is likely to have valuable application, this will be to a limited extent depending upon the class of product involved. While they will certainly introduce a casting method which will solve a number of their problems and which will raise their standard of quality in relation to cer-



HORIZONTAL-AXIS centrifugal ring and sleeve castings in high temperature alloys for gas turbine and jet engines.

Centrifugally?

A balanced assessment, from a British viewpoint, of the advantages and limitations of centrifugal casting of steel is presented in this article. The author, considering both centrifuged and centrifugally cast parts, warns of the dangers of excessive optimism over the possibilities of the process, and endeavors to delineate the most effective fields of application. He also explains why it is felt in Britain that some American terminology concerning the process may be considered as misleading and devotes considerable attention to discussing the role played by fluid pressure in producing sound, high-yield work.

tain types of casting, they will not, overnight as it were, find a remedy to all their foundry ills, financial or technical.

Although both vertical and horizontal axis centrifugal casting is applied extensively today for the production of annular and cylindrical castings for a wide variety of applications, it is essentially in the production of irregularly contoured steel castings, chiefly in sand molds rotating about a vertical axis, that the modern steel founder is interested. It is therefore to such asymmetrical and contoured centrifugal castings (generally termed *semicentrifugal* and *centrifuged* by American foundrymen) and their production that this article mainly refers. Examples of certain British-produced centrifugal steel castings of this type are illustrated on these pages.

The terms true centrifugal and semicentrifugal as applied in America to distinguish between certain variations in centrifugal casting technique have not met with general acceptance this side of the Atlantic, for while it is recognized that there is a distinction both practically and metallurgically speaking, the prefix *semi* is regarded as misleading. The inference to the uninitiated would be that a semicentrifugal casting is only half as good as the true centrifugal type and even that the two types are of different origin, whereas in point of fact neither of these assumptions is scientifically correct.

Metal poured into a mold of cylindrical internal contour rotating with adequate speed will clearly

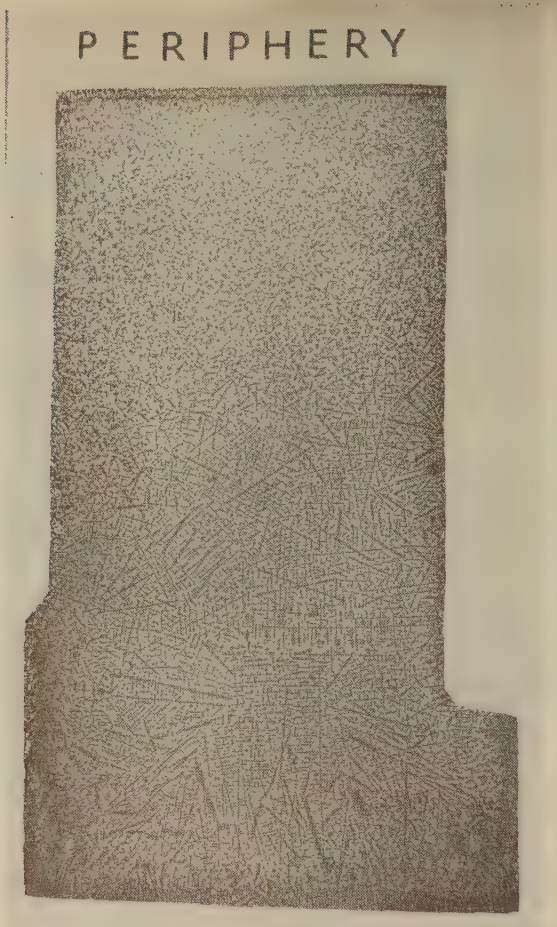


FIG. 1—Cross-sectional macroetch of centrifugally cast ring in 0.5 pct C steel, showing heavy outer chill crystal zone and peripheral concentration of centrifuged equiaxed crystals (full size)

form a cylindrical sleeve or pipe casting without a central core being necessary to determine the casting's internal contour. Providing the proper amount of metal is poured into the mold, its internal diameter will be of the desired dimensions. A centrifugal casting so produced is regarded as being made in a coreless mold and to be a casting of the most simple centrifugal type. The term simple is regarded as more accurately descriptive of such centrifugal castings than true, and the fact that centrifugal action is incidentally employed to impart a plain internal contour, instead of using a core, is looked upon as being useful practically but of no special virtue otherwise; certainly not of sufficient virtue to warrant such a distinction as conveyed by *true* and *semi*.

Such simple centrifugal castings as those which are referred to here can be made a little less simple in type by varying the internal contour of the rotating mold to give a corresponding irregular peripheral surface to the casting produced centrifugally within it, and still less simple by introducing an internal sand core to prevent too much metal being poured into the mold cavity. It is suggested that while these modifications depart from the simplicity of the original coreless mold, the casting so produced is yet essentially 100 pct centrifugal, and in no sense semi-centrifugal. Subsequent variations in mold contour and in internal core arrangements will obviously yield castings of widely different general contour while still depending upon centrifugal action to introduce the metal into the mold cavity.

Speed of mold rotation is clearly less important, rate of mold filling is usually greater and the rate of heat abstraction is probably lower in the case of vertical axis clustered centrifugal molds, but the essential principle governing the freezing mechanism of the metal within such molds remains unaltered as compared with the original simple, or so-called true, centrifugal type that has been discussed. The stigma of *semi* is not warranted.

On the other hand, American use of the term centrifuged in relation to castings produced in molds that are not rotated until they have first been filled with molten metal is felt to be fully justified. There is no doubt that metal entering a mold that is already rotating is immediately dispersed over a relatively large surface area of the mold and the resultant rate of heat absorption, particularly during early stages of the pouring operation, is proportionately high.

This ultrarapid heat abstraction in centrifugal casting causes correspondingly rapid freezing to progress from the mold periphery radially towards the center of rotation, i.e., unidirectional freezing is promoted towards what is both a running and a feeding center.

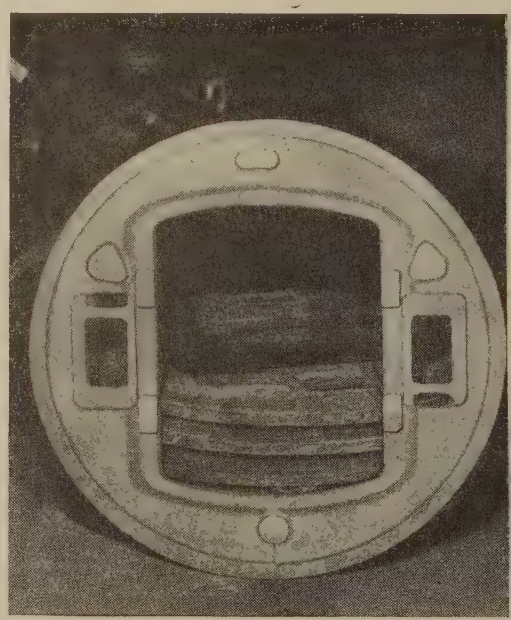


FIG. 2—Centrifugally cast armour steel heavy British

The fact that this ultrarapid freezing occurs within a centrifugal mold generally results in a substantial formation of solid metal in the peripheral zones of the mold, before the pouring operation is completed. This means that compensation for solidification contraction is taking place to an abnormal extent, as compared with static conditions, and continuously throughout the casting operation. The result is that by the time the mold is full the balance of "feed" necessary is relatively small. This undoubtedly is the factor that accounts for the characteristically high yield of centrifugal castings per ton of metal

cast, that is from 60 to over 90 pct, which is particularly evident in the case of horizontal-axis cast tubes and sleeves.

To omit the rotation of the mold until it is full of metal, i.e., to centrifuge, is to eliminate the mechanism of ultrarapid heat abstraction and involves the loss therefore of two of the most valuable characteristics of centrifugal casting proper —progressive directional solidification and high casting yield.

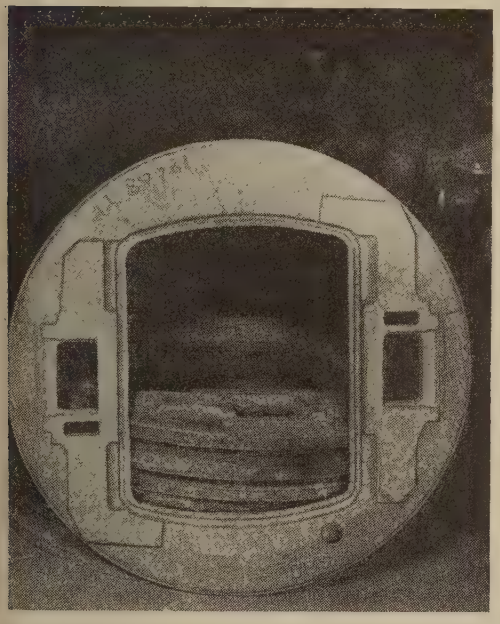
Centrifuging cannot conceivably induce directional freezing and from this point of view there is no technical difference between a centrifuged casting and one that has been made by orthodox static methods. An essential and important structural difference does, however, exist between such castings. This difference results from the fact that, under centrifuging action, primary equiaxed crystals of solid steel forming within the rotated mold will not fall under gravitational influence to the bottom of the mold, as in static casting, but will tend to accumulate in those parts of the mold that are remote from the axis of rotation. Turbulence and vibration effects are common to centrifuging and to centrifugal casting proper, and these undoubtedly are responsible in some degree for promoting nucleation, i.e., the formation of independent primary equiaxed crystals within the casting and its feeding heads, such crystals being subject to the influence of centrifugal forces, due to their density differential, as indicated above.

To summarize, therefore, a centrifugal casting has the advantages arising from (1) induced directional (radial) freezing and (2) centrifuging (radially) of primary equiaxed crystals (see fig. 1), whereas a centrifuged casting has only those arising from the second factor.

Popular technical opinion has frequently ascribed the inherent advantages of centrifugal castings to the fact that liquid metal is fed under high pressure into the molds. The importance of liquid pressure, as such, in the feeding of steel castings, while admissible insofar as it is necessary to keep the freezing layers of steel in contact with adequate supplies of liquid and for other minor reasons, is otherwise to be discounted. In considering this statement, which is regarded as being of fundamental importance in relation to a clear understanding of the problems relating to the feeding of castings, it should be remembered that there is an essential distinction between the influence of fluid pressure as such and that of gravitational or centrifugal force.

Other factors being equal, there is little evidence to show that steel freezing under such elevated pressures as can be attained in foundry practice is superior in any way to metal that has frozen either under (1) atmospheric pressure, as first fully exploited by J. Williams and later described by H. Taylor and E. Rominski, or (2) under pressure arising from ferrostatic head. Emphasis should rest upon the overriding importance of insuring correct and uninterrupted thermal gradients within the mold cavity, which if adversely disposed, no amount of fluid pressure can counteract.

Efforts to improve upon or modify the Williams' atmospheric head or blind riser, by providing artificial means of creating internal gas pressure instead of relying upon the orthodox admission of atmospheric pressure through a small core or otherwise, are to be commended up to a point, but only insofar as they may provide a blind riser that is more dependable and reliable in its operation in practice. To attribute other special advantages to such modified, i.e., artificially pressurized Williams' blind feeder heads, or to suggest that they make possible high casting - to - poured - metal - weight ratios (high



turret cover produced in thousands for the Churchill tank.

o o o

RIGHT

FIG. 3—Alloy steel centrifugal castings, 7-ft diam, for gun mounting gear.

o o o

yield), due solely to the fact that they may provide liquid metal under higher than atmospheric pressure, is quite unsupportable and is indeed regarded as being fundamentally unsound.

While the importance of liquid pressure in the feeding of steel castings, whether centrifugal or static, is thus regarded as being limited, it has been shown that conditions of pressure may inhibit, or at any rate depress, the formation of bubbles of gas as this comes out of solution during the freezing process. This may well be correct theoretically, but again in the case of a centrifugal casting unidirectional freezing is likely to be of considerably greater practical consequence in displacing gas bubbles towards the center of rotation, than centrifugally generated pressure will be in preventing actual bubble formation.

From the foregoing it is to be inferred that on elementary theoretical considerations, centrifugal casting is regarded as introducing certain factors which markedly influence the freezing process within a steel casting. These factors, without exception, are regarded as exerting a favorable influence upon the structural soundness of the casting so produced, and where practical and economic factors permit, centrifugal casting rather than orthodox static casting is undoubtedly to be preferred by the steel founder (see figs. 2 to 5, and table I). It should be noted, however, that experience has shown these practical and economic factors to be of considerable consequence in determining the advisability of applying centrifugal methods.

With regard to the practical limitations, it will be evident that with increasing size of casting the more unwieldy will become the centrifugal casting plant, and for mechanical reasons the production of very large centrifugal castings tends to become restricted to castings of certain dimensional types. Shallow rings of large diameter (10 to 15 ft) and tubes of relatively small diameter but considerable length (30 ft) are generally regarded as representing the maximum range of castings produced centrifugally, although theoretically very much larger dimensions are obviously possible. As to whether castings such as those described should be produced centrifugally will very largely depend upon the frequency with which they are required, which in turn justifies the maintenance and space absorption of suitable casting machinery in the foundry. Continuous requirements for large centrifugal castings are, in other words, clearly necessary before the provision of adequate casting plant is warranted on economic grounds.

In the case of smaller castings, that is castings of dimensions which do not involve mechanical problems in casting plant, the application of centrifugal methods is governed both by design and again by quantity requirements. With regard to the first factor, it will be understood that where a casting is so designed that it is possible without difficulty to provide adequate feeding heads and convenient runners (centrally and axially) within a rotating mold, the adoption of centrifugal casting will be relatively simple. In instances where a casting is so designed that it requires feeding in a number of widely dispersed and even inaccessible positions, centrifugal technique becomes more inconvenient, though seldom impossible, to apply. With this onset of inconvenience there also arises the inevitable increase in production costs.

While there will always be borderline cases in which a decision to cast statically or otherwise may depend upon individual opinion, foundrymen will agree that most castings can be classified as suitable for one casting method or the other for reasons previously indicated and dependent upon operational conditions and circumstances peculiar to the foundry concerned.

It must be emphasized that each casting design merits individual consideration and that experience has proved that castings, which for design reasons present more than usual difficulties in feeding by static methods, are frequently adaptable to centrifugal casting, both conveniently and with advantage from an internal soundness aspect. The converse, i.e. castings inconvenient to produce centrifugally are frequently adaptable to static treatment, is equally true.

The important issue, based on these findings, is that while within certain size limits the majority of steel castings can be produced centrifugally, only a limited number will for prac-

TABLE I

Some typical mechanical properties of Centrifugal Alloy steel castings for Aircraft

Castings From Which Test Bars Were Cut	0.1 pct Proof Stress, psi	Ultimate Tensile Strength, psi	Elongation in 2 in., pct	Reduction of Area, pct	Izod, ft-lb
Shock absorber cylinder	180,300	205,100	7.0	10.6	9
Wing hinge fitting	166,600	182,600	9.4	17.8	11
Undercarriage fork	154,100	168,500	11.3	30.6	15
Tail wheel pivot bracket	144,100	160,000	13.2	26.0	25
Undercarriage axle	129,100	143,900	14.1	37.1	35
Main lifting fitting	118,300	136,200	16.9	50.0	50
Variable pitch propeller barrel (hub)	112,000	128,000	17.8	54.0	56

FIG. 4 — Centrifugally cast elbows for high pressure plant service.

tical reasons be cast in this way conveniently. When the convenience factor is high, the advantages accruing are also likely to be high.

While the running of molds containing thin metal sections is facilitated by centrifugal action (see particularly the castings shown on pp 64, 65), it will be recognized that breakdown or washing of the mold face under the severe action of the rapidly flowing molten metal is prone to occur. This has led to the extensive, and relatively expensive, general use of oil-bonded sands for centrifugal casting purposes.

It is claimed that green, as opposed to dry sand molds, have been used for centrifugal casting purposes but experience in Britain is such that whereas such practice may be permissible for centrifuging, dried sand molds are regarded as necessary for successful centrifugal casting production. This is an important factor to be taken into consideration when comparing centrifugal molding costs with those of static methods.

Except in cases where very large numbers of castings of a type are required, as in the production of certain steel castings for automobiles, it is not normally possible to lay down continuous or mechanized centrifugal casting plant and a certain lack of flexibility, necessarily associated with a general purpose centrifugal installation, must be expected when making comparisons with alternative static procedures.

On the credit side, the high yield percent must not be overlooked although many steel founders have been seen to throw away the potential advantages on this score, by allowing their operators to fill unnecessarily large runner bushes and down-gates with valuable excess metal which performs no useful function whatsoever as far as the castings within the mold are concerned.

Also on the credit side, steel castings produced centrifugally are normally found to have fewer feeding heads to be flame cut and consequently less grinding. Steel castings produced centrifugally about a horizontal axis have no heads to remove at all and their yield, as mentioned previously, is exceptional. Wherever a ring or sleeve can be produced as a horizontal axis centrifugal casting there is no doubt that the method will be attractive, not only technically and practically, but also economically.

During wartime in Britain centrifugal steel castings played an important part and for the future it can be said that they will continue to do so, probably in less numbers, but certainly in a very much wider range of applications. Many engineering developments in the future, both in Britain and elsewhere, will undoubtedly be made possible by corresponding developments in steel foundry technique, and of the latter centrifugal casting, correctly applied, is to be regarded as among the most important.

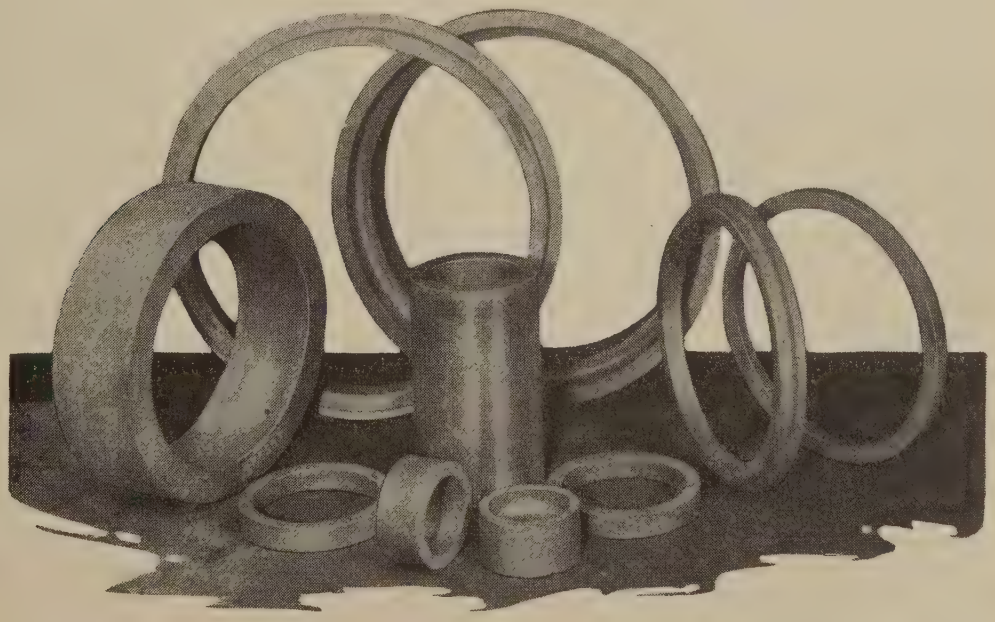
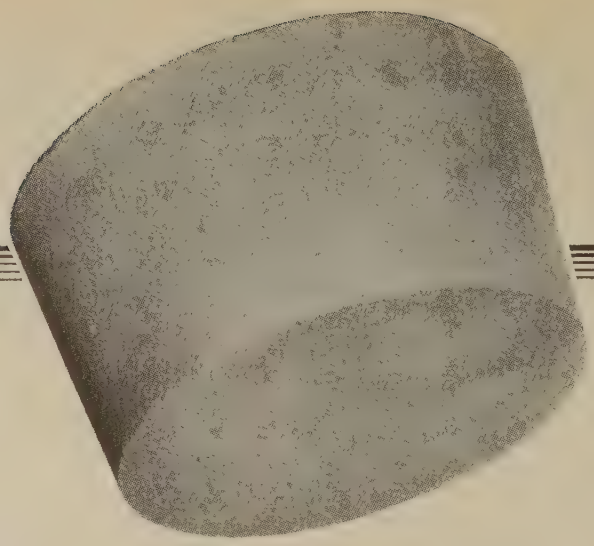


FIG. 5—Group of centrifugally cast high tensile low alloy steel castings for aircraft.



A report on the use of 45,000 carbon mold plugs in the production of large alloy steel ingots is presented herewith. The author discusses the advantages of the use of carbon plugs, such as lengthened mold life, absence of spalling, elimination of refractory inclusions, avoidance of soaking pit contamination and minimizing of many leakers and other pouring difficulties. A comparison of carbon pickup of carbon and ceramic plugs is also given.

By HARRY F. WALTHER

Superintendent of Melting, Steel & Tube Div., Timken Roller Bearing Co., Canton, Ohio

° ° °

THE plant of Timken Roller Bearing Co. in Canton, Ohio, is an alloy steel producer using cold scrap charges, pouring both openhearth and electric furnace heats into 4000 to 6100-lb ingots. Good bottom closures in the molds are more than normally essential for the production of good alloy steels in these tonnages. It is the experience of this company that tight closures cannot be achieved with ceramic mold plugs due to the lack of consistent, accuracy in plug dimensions. Good closure has, however, consistently been accomplished by the use of carbon mold plugs which are manufactured to an accuracy of ± 1½ pct of the diameter (3/32 in. on the plug used at Timken). The carbon plug insures close fit and good bottom closures when placed in well-formed plug holes.

The plug employed is a standard form made by National Carbon Co., Inc. It is 4½ in. deep, with a top diameter of 5⅞ in., a bottom diameter of 5 1/16 in. and a taper of 2⅛ in. (in diameter) in 12 in. The plug hole opening of the mold is 6 in. to 5 in. over a 6 in. depth, or a taper of 2 in. in 12 in. It has been found that the plug is very effective in prolonging mold life, for as the bottom of the mold becomes eroded, the slightly faster taper of the plug assists it to fit snugly down into the opening. The close fit that is maintained prevents undercutting and erosion in the plug hole.

Timken has used 45,000 of these carbon mold plugs since they were first placed in routine use during August 1946. The experience with this type of plug can be summarized as follows:

(1) Carbon plugs are never out-of-round and are consistently accurate in dimensions.

(2) They are structurally strong and may be handled without damage.

(3) They can be hammered into place in the mold opening without being crushed.

(4) A large percentage may be employed a second or third time.

(5) Their use has eliminated 90 pct of the leakers—the incidence is rarely more than one leaker in 200 pours. This absence of leakers has reduced steel loss to a minimum and has prevented the burning of mold buggies and railroad ties and rails under the mold buggies.

(6) Reliance on the plugs has improved pouring conditions by eliminating stop-

Carbon Mold Plugs

. . . In Alloy Steel Production

pours, skulls, sticking blackheads and other pouring difficulties.

(7) Carbon mold plugs do not spall.

(8) There can be no refractory absorbed into the ingot from the plug, which practically eliminates the possibility of inclusions from the mold plug.

(9) Little or no carbon pickup is noted in ingots of steels over 0.10 C.

(10) Elimination of burn-outs in the plug holes has improved mold life by 10 pct.

(11) There is no contamination of soaking pit bottoms if the carbon plugs adhere to the ingot bottom.

(12) As compared with any other plug of the same size, the carbon type is light and very easily stored or handled. Iron plugs of this size weigh 29 lb, carbon plugs 6.2 lb and ceramic plugs 7.5 lb.

However, the fullest benefits cannot be obtained from carbon mold plugs unless certain practices are initiated to correct mold deficiences or details of practice. For example, the molds as delivered from the manufacturers often have rough plug holes. Such a condition precludes proper fitting of the plugs and must be corrected. Also the material used for coating mold chambers tends to collect on the sides of the plug hole and become vitrified, especially when tar is used. Obviously if this material is not removed, the plug cannot fit properly.

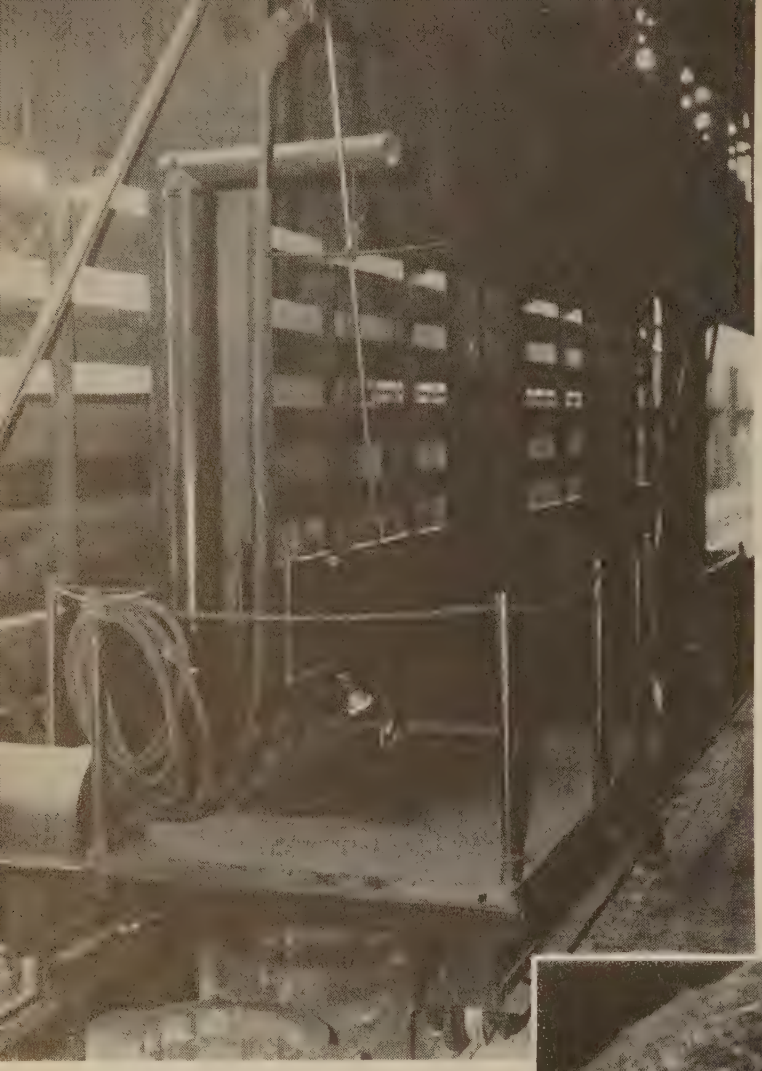
Both these conditions have been solved at Timken by mounting a flue cleaner on a movable platform that operates over the molds and inserting a reamer operated by compressed air in the plug hole to ream it clean. This routine operation removes all foreign material and leaves the hole as clean and as close to round as possible, thus permitting a close fit when the plug is inserted. Fig. 1 illustrates the manner in which the movable platform operates, while fig. 2 shows the flue cleaner in position to ream a plug hole. The reaming operation requires less than 1 min per mold. Without some operation of this sort the full benefits of the carbon plug cannot be realized and leakers will result in num-

TABLE I

Comparison of Carbon Pickup with Carbon Plugs and with Ceramic Plugs

Heat No.	Carbon Plugs (Position)	Ladle Carbon, pct	Average Bloom Carbon*		Over Ladle Average**
			Carbon Plug	Clay Plug	
1	Ingots 1 through 8	0.09	T-0.095 B-0.090	T-0.095 B-0.082	Carb 0.002 Clay 0.001
2	Ingots 1 through 8	0.12	T-0.135 B-0.130	T-0.125 B-0.125	Carb 0.012 Clay 0.005
3	Ingots 1 through 8	0.13	T-0.150 B-0.140	T-0.150 B-0.140	Carb 0.015 Clay 0.015
4	Ingots 1 through 8	0.12	T-0.120 B-0.120	T-0.130 B-0.125	Carb 0.000 Clay 0.007
5	Ingots 1 through 8	0.10	T-0.120 B-0.105	T-0.115 B-0.100	Carb 0.012 Clay 0.007
6	Ingots 1 through 8	1.00	T-1.056 B-1.014	T-1.061 B-1.026	Carb 0.035 Clay 0.043
7	Ingots 9 through 16	0.37	T-0.403 B-0.373	T-0.405 B-0.376	Carb 0.018 Clay 0.020
8	Ingots 9 through 24	0.32	T-0.346 B-0.325	T-0.337 B-0.324	Carb 0.015 Clay 0.010
9	All ingots	0.13	T-0.145 B-0.140	.....	Carb 0.012
10	All ingots	0.19	T-0.205 B-0.190	.....	Carb 0.007
11	All ingots	0.15	T-0.170 B-0.157	.....	Carb 0.013
12	All ingots	0.26	T-0.287 B-0.265	.....	Carb 0.016

* T = top of bloom; B = bottom of bloom.
** *Carb.* = carbon plug; *Clay* = ceramic plug.



bers approaching those encountered with ceramic plugs.

In order to insure warm, dry parts it is also standard practice at Timken to store carbon and ceramic plugs, graphite blackheads, and ceramic stopper rods and pouring nozzles in ovens (see fig. 3) which are gas heated to about 125°F.

Due to the high mechanical strength of carbon plugs, there are no handling and installation losses and the plugs can safely be hammered with a wooden pole into the hole without the usual risk of chipping off the corners or cracking the plugs, such as occurs with ceramic forms. The very low coefficient of thermal expansion of carbon (one fifth that of cast iron), combined with good thermal conductivity, results in an unusual resistance to thermal shock. There is no evidence of spalling, nor of carbon absorption in the ingots.

Use of the carbon plug eliminates one of the five sources of ceramic inclusions. While stopper rods, pouring nozzles, ladle linings and hot tops still remain as sources of ceramic contamination, the ceramic mold plug has long been considered a principal offender due to the more severe thermal shock and erosive wear it must undergo. In the manufacture of the carbon plug the binder employed is a carbonaceous material like the rest of the plug. The very small proportion of ash in the plug is so well distributed that if any portion of the plug is incorporated into the ingot,

ABOVE

FIG. 1—The movable platform shown here carries an air-driven flue cleaner for reaming the plug hole clean. A good bottom closure fit is essential for the most satisfactory service from the plug.

o o o

RIGHT

FIG. 2—The flue cleaner (see fig. 1) in position to ream the plug hole opening. The reaming operation requires less than 1 min per mold.

the amount is so very slight that alumina or silica is absent in any but the most minute traces.

Little difference is shown between the two types of plugs with respect to carbon pickup, consequently carbon plugs, are used exclusively for all ingots down to 0.10 C steel for critical applications.

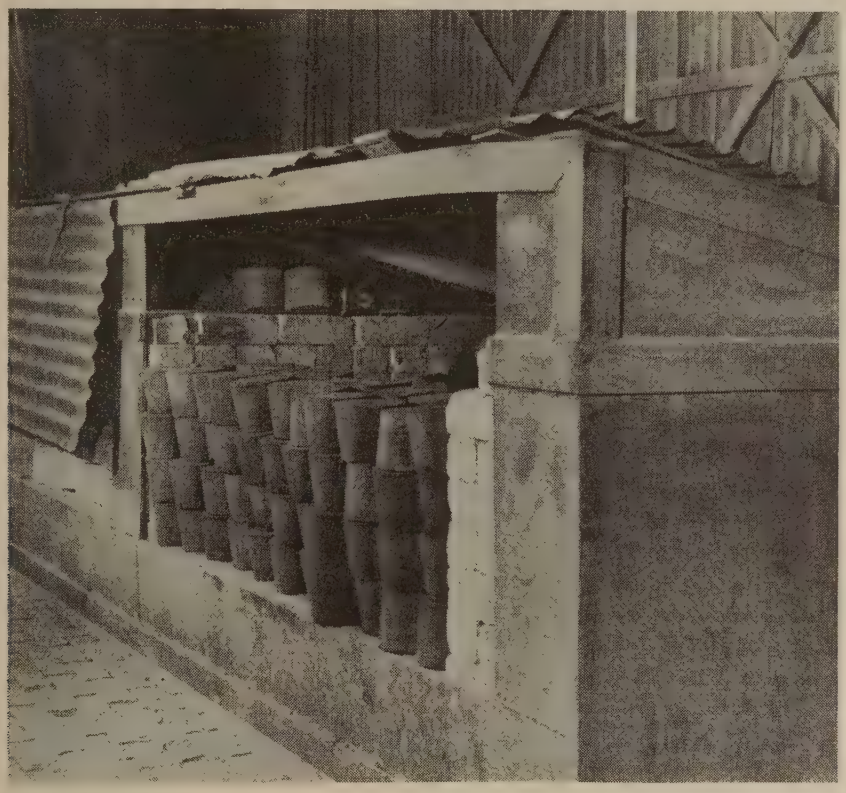
A series of tests showed a difference of only two hundredths of a point between the two, the average pickup on all heats with split drags being 0.0133 for carbon plugs and 0.0135 for ceramic plugs. In the test 12 heats were poured into a number of molds using both types of plugs, and bloom coupons taken from the top and bottom to check the average carbon pickup against the ladle carbon. A list of the heats and the comparative carbon check is given in table I.

Another advantage gained from the carbon plug is the absence of clinker-forming contaminations in soaking pit bottoms, for the carbon is kindred to the coke in the bed and will not cause cleaning difficulties if carried into the pit by the ingots.

Carbon plugs are much less expensive than iron plugs, although the initial cost of carbon plugs is higher than that of their ceramic counterparts. However, the fact that none of the carbon plugs are lost due to breakage in handling, and that many of them can be used two or three times (see fig. 4), tends to offset the price difference between carbon and ceramic plugs. Moreover, it is evident that absence of leakers results in a number of operating economies.

First of these economies is a decided gain in the speed and confidence exercised by the steel pourer, who can control ingot pouring much better when an efficient mold bottom closure is effected, and thus eliminate to a large extent such pouring faults as stop-pours, the splashing of mold walls due to choking the stream in trying to avoid leaks, skulls in the ladles, sticking blackheads, sticking stoppers and burnt out nozzles.

Second is a direct saving in metal formerly lost in ingot butts left from stop-pours, or lost by leaking through the plug holes onto rails and ties beneath the pouring platform. The cost of labor saved from cleaning up the spills is also a factor.



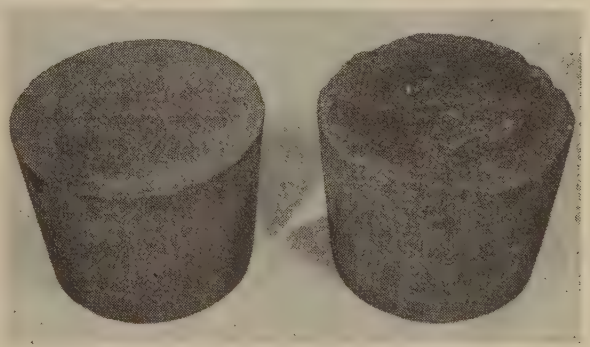
LEFT

FIG. 3—Carbon plugs are stored in gas-fired ovens to insure warm, dry parts. The ovens are maintained at about 125°F.

o o o

BELOW

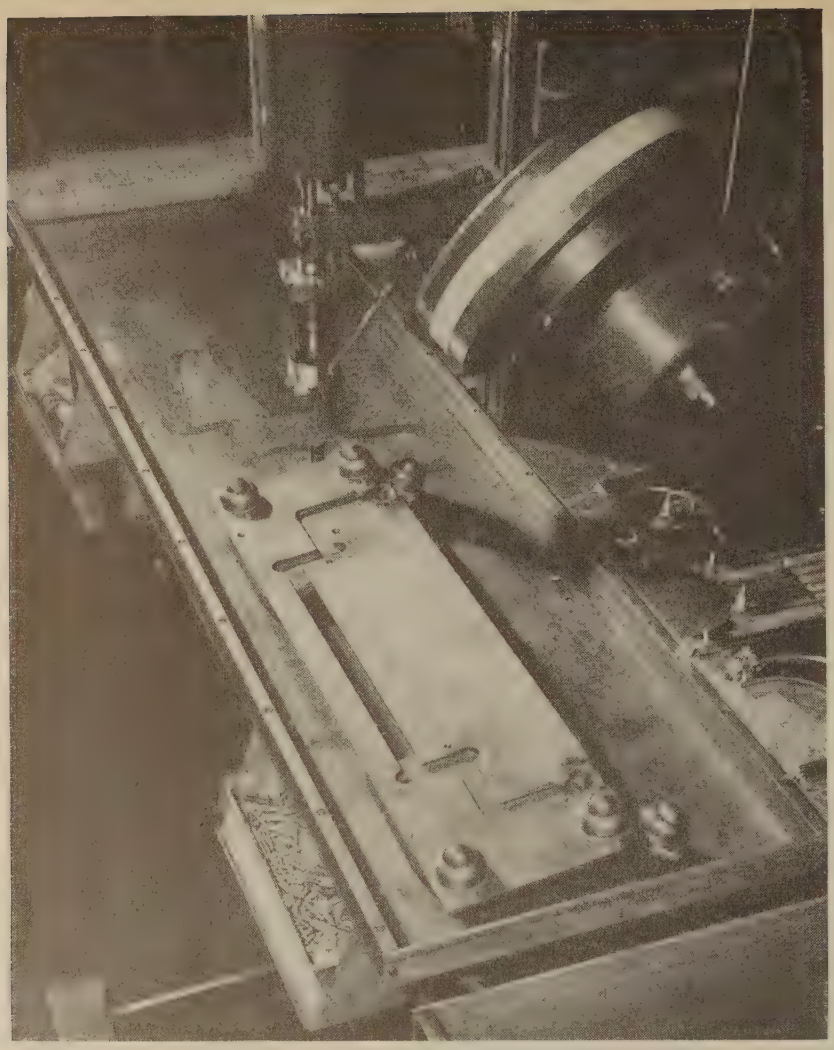
FIG. 4—A new carbon plug is shown here on the left, while a plug that has been used once is shown on the right. Because of the very slight amount of erosion on the used plug, it may be used once or twice again.



Third is the gain in mold life through reduction of burnt out plug holes and mold bottoms. Taking into account the changes in metallurgical composition of molds that have occurred in the last 2 years, it is estimated that mold life has been extended 10 pct at Timken by use of the carbon plugs. Fourth, and most important, a decided advantage has been gained in producing alloy steel of the best quality.

Rapid

By HERBERT CHASE



SETUP for rapid stud driving in boss holes of a diecast radio grille, one of which is shown in the fixture under a driving head. The holding fixture rolls on the table and is tilted when driving two studs on the angular face.

AN automatic feeding and a quick-shifting carriage arrangement permits the application of up to 6000 studs a day into zinc-alloy diecast radio grilles. One of the ac spark plug divisions of Generals Motors Corp., at Flint, Mich., has been using this technique. Each of the radio grilles has, on the hidden face, six bosses with holes for attaching these studs. After the grilles are buffed, plated and painted, they are delivered by chain conveyer to a station where the studs, ¼ in. diam, and of the self-tapping type, are driven into place.

The fixture employed as well as the driving head, are shown in the illustration at the right. Other details of the fixture and the rotating hopper from which studs are fed one at a time are shown in the photograph above. After studs are loaded into the hopper, the operator sets a grille into the fixture, brings each boss hole in succession under the driving head and presses a pedal. This lowers the head and each stud is driven automatically as the head descends.

Driving heads are applied to the spindles of drill presses and take-offs from the drill presses keep the hoppers rotating. As both ends of the studs have the same thread, it makes no difference which end is down. Feed is through a tube from the hopper and operation is so arranged that the studs feed into the driving head one at a time where they are automatically gripped by the jaws that do the driving.

The fixture, as shown above, is inverted. It is equipped with six rolling ball feet which bear on the extended table of the press. The table has a ledge on all four sides so that the fixture cannot roll off.

On the bottom face of the fixture is a slot that joins six holes. The center of each of the holes in the slot is in line with one of the six holes into which studs are to be driven when a grille has been located in the fixture. Directly under and in line with the stud driving head is a pin fixed in the table and carrying a roller that fits into the irregular slot. As the fixture is shifted along the table, the roller guides the motion and, when the fixture comes to rest with the roller in one of the six slot holes, the corresponding stud hole is in line with the stud driver.

Four of the stud holes have axes parallel and at right angles to the main face of the grille, but the other two hole axes, though parallel to each other, are at right angles to a secondary face of the grille which slopes under the edge of the car instrument panel. This makes it necessary to employ a fixture that is easily tilted to bring this pair of holes into line with the driver. It also accounts for the fixture having six rather

Stud Driving Fixture

The development of a special fixture that automatically locates the radio grille of an automobile under a hopper fed stud driver permits the setting of up to 6000 studs a day by one operator.

A VIEW of the setup with driver and rotating hopper in the background and the fixture in the foreground in inverted position to show the slot which fits the roller under the driver to guide and locate the fixture quickly.

than four ball feet, the extra pair being used when the fixture is tilted.

To drive a set of studs, the operator places a grille into the fixture, the recesses of which locate the piece properly in reference to the fixture. The fixture is then tilted and so located that the roller is at the end of the slot under one of the studs on the inclined face, and this stud is driven. With the fixture laid flat, it is shifted to the nearest slot hole (the position shown above) and this stud is driven. The fixture is then shifted to the three other slot holes in succession and the corresponding studs are driven at these locations. The fixture is the shifted and tilted to drive the final stud over the end slot hole, completing the driving. The cycles are repeated but in reverse direction, as the operation is started at the opposite end of the slot from that at which the prior cycle was started. Operators become so adept at shifting the fixtures, guided by the roller in the slot, that exceptionally rapid production results.

Powdered Iron in Electrode Coatings

REVIVED interest in the use of iron powder for welding electrode coatings in England has accompanied the renewal of supplies of Swedish sponge iron. Techniques involved in this process begun some years ago in England together with present developments were recently described in the British publication, *Sheet Metal Industries*.

In what is claimed to be the first published data on this process, iron powder amounting to not more than 15 pct of the weight of the wire core was mixed with various flux and slag forming agents. The basic principle of the process depends upon the protection from atmospheric oxidation and nitrogen absorption, which the iron affords the weld metal. There is a tendency for the added iron powder to oxidize instead of the depositing metal.

During the war, a new type of so-called basic electrode was developed in Sweden which is popular in that country and on the continent. These electrodes have a high content of fluorspar, limestone and iron powder, together with materials like ferrosilicon and ferromanganese which are also included in the coating. A British patent cites particulars of this type of electrode which is an all-purpose type and can be used for most grades of steel. It is particularly recommended for steam boiler plate and high alloy steels. Other characteristics are smoothness in working, freedom from spattering, low oxygen content in weld deposit and stable arc. It is not for use with ac current.

A method developed in the United States for producing 18-8 *welding rods by extruding a powder metal mixture was described in* THE IRON AGE, *Dec.* 19, 1946, *p.* 68.—*Ed.*

Use of metal powder in welding electrodes has also received attention in England. Techniques of powder metallurgy have been put into use for the manufacture of both the electrode coatings and the electrodes. Owing to the improved qualities of metal produced by powder metallurgy and the flexibility in the manufacture of alloys or in adding fluxing materials, it has been suggested that billets of metal or alloys be manufactured by powder metallurgy and subsequently forged or rolled and drawn into wire.

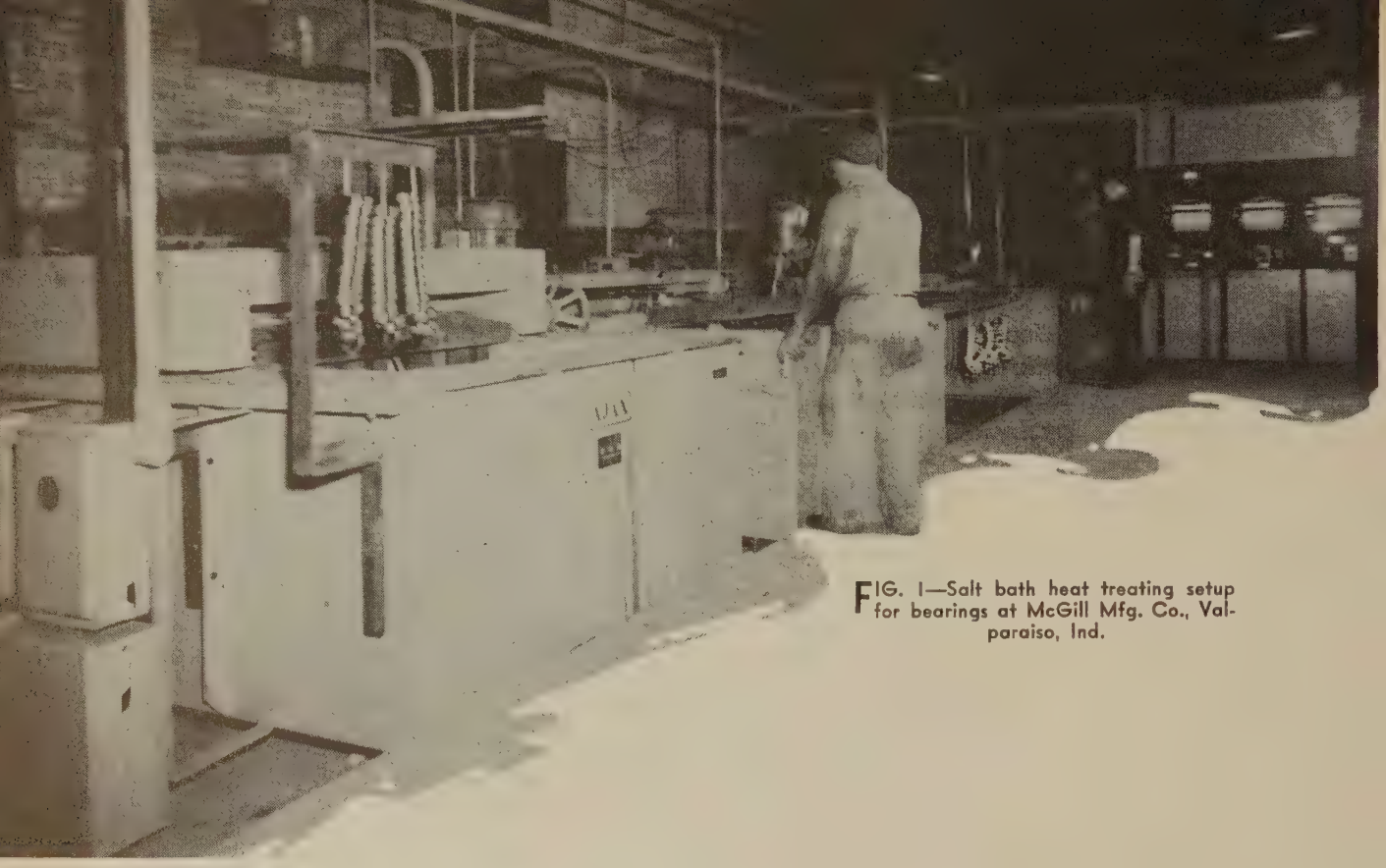


FIG. 1—Salt bath heat treating setup for bearings at McGill Mfg. Co., Valparaiso, Ind.

Isothermal Heat Treatment

Utilization of isothermal salt bath heat treating in the production of bearings and bearing races has resulted in a decrease in processing time, less distortion and brittleness and an increase in uniformity of hardness. The author describes herein the equipment and materials used and describes the heat treating cycles followed in attaining best results.

THE problem of hardening bearing races has always been a vexing one for bearing manufacturers. The pitfalls, of course, are brittleness and nonuniformity of hardness in varying thicknesses of race sections.

In order to solve this problem, McGill Mfg. Co., Inc., has placed in operation a complete new isothermal heat treating department. This department utilizes the following equipment:

(1) A pot, 42 x 24 x 18 in. salt depth, heated by four pairs of nichrome electrodes to a maximum temperature of 1575°F, and using a neutral salt, Aeroheat 1200. The furnace rating is 120 kw.

(2) A pot, 60 x 30 in., heated by 18 sets of Calrods to 400°F, and using nitrate salt Aeroheat 300. The rating is 90 kw. This is the isothermal quench pot.

(3) A space 8 ft long for cooling (hardening takes place during this cooling).

(4) A pot, 48 x 30 in. heated by six sets of Calrods to 350°F, and using nitrate salt Aeroheat 300. The rating is 30 kw. This is the tempering bath.

(5) Two water baths, the second being hot, and containing 4 oz of nitrate per gallon of water.

Rated capacity of this equipment is 500 lb per hr, but 600 lb of small races are easily handled each hour. The 1575°F bath runs at about 160 amp, 13 v and idles at 9 to 11 v. The current arcs through the bath, requiring a molten path, or a carbon path in starting, for the passage of current.

The temperature is not allowed to drop below 1200°F during holidays. The Calrods produce

heat by the conduction of current through the heating elements. In both the isothermal quench pot and the tempering bath the respective operating temperatures of 400°F and 350°F are maintained through holidays.

McGill hardening procedures vary according to the size of pieces:

Smallest size (about ¼ in. OD)—heat 6 min at 1560°F; quench 1½ min at 400°F; air cool 30 min (1 hr on hot day); temper 30 min at 350°F.

Medium size (about 6 in. OD)—heat 8 to 12 min at 1570°F; quench 3 min at 400°F; air cool at least 30 min; temper 30 min at 350°F.

Largest size (about 9½ in. OD)—heat 22 min at 1575°F; quench 5 min at 400°F; air cool 1 hr; temper 30 min at 350°F.

Using these procedures, the final hardness is 62 to 62½ Rc on all spots. Never has the hardness gone outside the 61 to 63 Rc range specified on drawings. To date the largest piece hardened in production by the new salt bath method is a race which has a 9.652 in. OD, 8.343 in. ID, and is 3.020 in. wide. This gives a thickness of 0.654 in. The race has solid ends, which are 0.290 in. thick and 7.768 in. ID. Final hardness on this race was 62 to 62½ Rc at all points. The fracture (for testing purposes) was admirable. It was secured only after applying a much greater drop load than is normally required to break an oil-quenched race of the same size.

Salt bath-hardened races, 2⅜ in. in diam, fracture at slightly over 3 pct reduction in diameter. Oil-hardened races of the same type and size fracture at 1.3 pct reduction of diameter. This clearly indicates that the salt bath quench results in a tougher structure.

The microscopic structure of salt bath-hardened specimens is distinctly different from that of oil-hardened pieces. The carbides are smaller and more uniformly distributed. When lightly etched, the microstructure reveals a multiplicity of wavy, fine lines uniformly spaced over the entire surface of the specimen. These are revealed with a magnification of 1500.

Extensive load tests of McGill bearings, in which all parts are salt bath-hardened, indicate a life lengthened over three times that of oil hardened bearings at the same speed and load. The poorest test of salt bath hardening exceeded the best test ever obtained of an oil hardening bearing at the same speed and load, by 31 pct. Correspondingly, the best salt bath test lasted over eight times as long as the best test ever made on an oil-quenched bearing at the same speed and load.

Other important advantages of salt bath heat treatment found by McGill are the more readily retainable roundness of bearing races, the decreased brittleness, and the more uniform hardness of varying thicknesses of race sections. In the event that additional heat treatment of parts is required because of possible operational deficiencies, it is only necessary to repeat the process. No prior annealing is necessary.

Wear test experiences indicate that the best salt bath-hardened practice is to avoid soaking at high temperature beyond the minimum time requirement for the necessary hardness. This necessitates some time and temperature variation in heating, according to the size of the piece to be hardened. It explains the three different procedures followed by McGill in treating varying sizes of bearing races.

The material used for McGill races and rolls is predominantly 52100 steel. Tubes are ordinarily hot-rolled, pickled, annealed, and machine-straightened. Inside and outside diameters maintain an accuracy of ±0.015. For larger sizes and special jobs, 52100 forgings are used.

Prior to the adoption of the salt bath process, hardening was done by quenching in oil from 1535°F ±10°F for all sizes of bearing races. The periods varied from 40 to 65 min, of which one third to one half was preheat at below the critical temperature.

With the new salt bath equipment, the stages involved in heat treating require only about 55 min, compared to over 3 hr formerly.

Aids Bearing Production

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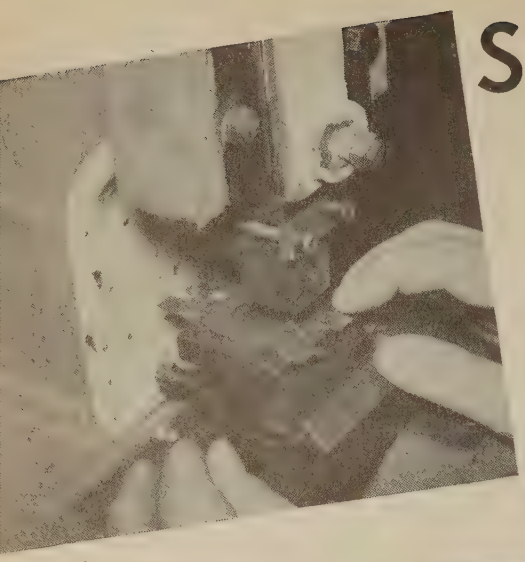

Semiproduction Runs

Faced with the problem of producing large varieties of small stampings on an experimental basis, Tinnerman Products, Inc., has developed an experimental production department utilizing temporary tooling and some 220 small kick presses which effectively fulfills this need. This article describes the equipment and techniques used in this unusual activity.

ABOVE

FIG. 1—Setup of a kick press for forming Speed Nut fastenings as part of a lock assembly. While nearly completed, this stamping has yet to be formed into a four-wall box, the wide faces of which are about 1.5 in. sq. Further operations in other presses are located by guide plates.

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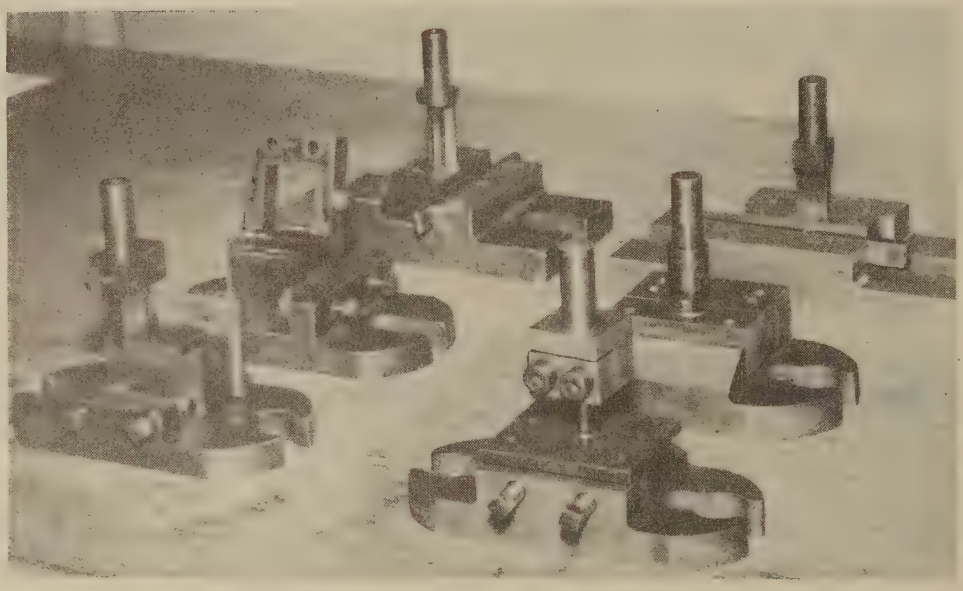
FIG. 2—Typical bending and piercing tools that include dies that are interchangeable in various bolster plates made to shop standards. Thus they fit any of the 220-kick presses employed.



TO produce large varieties of small stampings on an experimental or sample basis, Tinnerman Products, Inc., Cleveland, has an experimental production department utilizing temporary tooling and small kick presses. When its standard Speed Nuts or Speed Clips do not completely meet requirements, Tinnerman designs and turns out stamped parts incorporating fasteners by this method in quantities ranging from 50 to several hundred.

In all cases, these special stampings include one or another of the standard Tinnerman fasteners, produced as an integral part of a stamping or a stamped assembly. Thus, the fastener may include a strap or be formed as a portion of some unit peculiar to the customer's product. In the stamping will be incorporated one or more Speed Nuts or Speed Clips to fasten the stamping to some mating part.

Having designed the special stamping, it is necessary to make enough samples to permit proper tests. If so many samples were to be made by hand, costs would be prohibitive. Also, it would not be economical to make production dies until the samples have been given sufficient trial. Consequently, the company has developed facilities for making the samples largely with interchangeable stock tools designed only for semiproduction runs.

The tools consist chiefly of punches and dies that are carried in stock and are used, generally, in kick presses to pierce holes or slots, blank corners, make bends, do other forming, or even perform certain light drawing operations. A typical operation of this type is shown in fig. 1, where the prongs of the screw form of the Tinnerman fastener are being formed.

In general, only one or two operations are handled on a press, thus often requiring many presses for a given job. There are about 220 such presses in the shop. However, once set up, several hundred stampings can be run through at a fairly high rate of speed. Each piece will be an exact duplicate of the others because proper locating points are established and care is exercised to keep within dimensional limits.

If the sample fastener is acceptable and required in large quantities, production tooling is designed and built. However, while such tooling is being set up, enough of the special fastenings can be produced from the experimental tooling to keep the customer's production moving.

# of Experimental Stampings

Although special tools, including punches and dies, have to be made on some occasions, the number of punches and dies carried in stock is large and these can usually do the great majority of jobs. There are, for example, bending dies, shown in fig. 2, of almost any radius from 1/16 to 4 in. A large stock of punches for circular holes, slots, notches and other shapes are in stock, shown in fig. 3. Punches and dies for piercing round holes from 0.032 to 1 in. diam. are stocked in sizes for each 0.001-in. increment within this range. Many types and sizes of bolster plates are also stocked, and at least four types of beds are kept on hand. All punches have standard shanks so that they are quickly interchanged and dies are designed to fit standard holders or bolster plates, making for ready interchangeability.

To make best use of these tools and to design, improvise and make new ones when needed, a group of toolmakers is kept on the job. When the drawing and specifications of an experimental stamping are received, the required operations, tooling, setup procedure and operation sequence are determined. If temporary tools not already in stock are needed, the toolmaker makes what is necessary. Such other tools as are needed are drawn from stock, and each of the setups, required for the experimental run is made.

In doing this, several blanks of the required size and thickness are put through each setup in succession so as to make certain that the individual tools serve their respective needs properly and the product dimensions come within set limits. In many cases, the product has to be given a trial test to make sure that it fits a given specification.

As nearly all Tinnerman fastenings are hardened after forming, samples completed are set as a batch to the production heat-treating and finishing departments where they go through the same cycle as production items. This avoids extra facilities in the experimental department and gives the sample product the same treatment that a production lot receives.

Once the tools have been proved, the toolmaker lists every step in the production sequence, indicating on a written form the tools that go into each setup and how they must be arranged to yield the required product. This record not only serves as a guide for duplicating the setup but provides the designer of permanent tooling with many data that are helpful.

When an experimental setup is contemplated and proved, the presses are turned over to ordinary operators who run through as many samples as the customer may require. Tools are then disassembled and put back into the tool crib. Being properly identified by the record, they can be reassembled for further use.

In the toolroom, there is kept in display files a specified number of samples, properly indexed, so that reference to them can be subsequently made, such as in the case of a similar problem being submitted. If the experimental product gains customer approval and production tools are built, some overrun is commonly made and kept in stock so that samples will be on hand and small lots can be shipped without making a new setup and a new run.

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FIG. 3—Some of the hundreds of piercing dies and punches kept on hand for use in making experimental setups for short run production of sample stampings. Each die and each punch fits a standard holder so that interchangeability is attained.

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Causes Of Diecasting Irregularities

Causes of some common diecasting irregularities affecting dimensional tolerances, mechanical properties and machinability are explained and illustrated in this, the second section of a two-part article. The author covers each type of defect concisely, yet thoroughly, and offers suggestions for the elimination of the irregularities.

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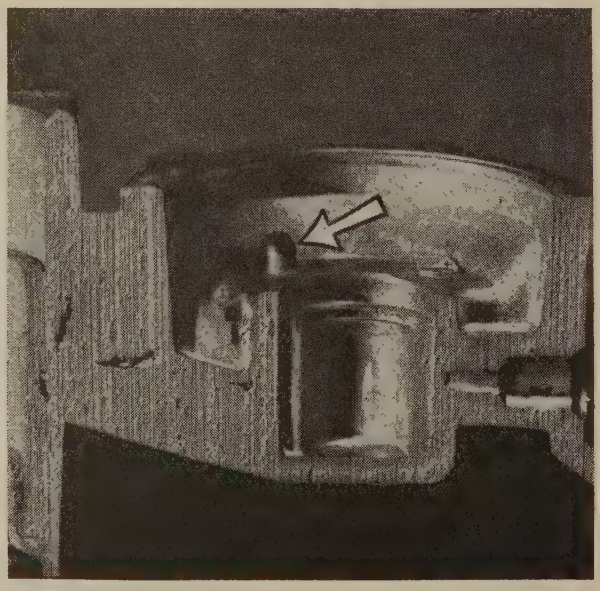
THE various factors that influence dimensional precision of a diecasting are the actual dimensional precision of the die cavity itself, the thermal expansion of the die, the shrinkage of the diecasting alloy, and the accuracy with which the relation of the movable components to one another of the die can be maintained.

Diecasting dies are rigid, inelastic, and inflexible bodies. When properly built, they will not distort dimensionally even under the influence of very high injection pressures. The die cavity portions in each half of the die are machined to very close dimensional tolerances. Small dimensional tolerances between fixed points in a single half of the die can be held very closely. Small dimensional tolerances (±0.001 in. per in.) between a fixed point in one half of the die and a fixed point in the other half of the die cannot as a rule be held so closely due to the fact that many factors influence the geometrical relationship of these two halves of the die. Small dimensional tolerances between a fixed point in a die half and a movable point in the same die half, viz., on a core, cannot be maintained as closely either as can the dimension between two fixed points in the same half of the die.

In the first part of this article, published in THE IRON AGE, *Nov.* 13, 1947, *p.* 82, *the author discussed the normal characteristics of diecastings, the effects of pressure, temperature and design, and irregularities affecting surface finish.—Ed.*

It is obvious therefore that the same degree of dimensional precision cannot be guaranteed between various points on the movable portions of the die cavity as can be guaranteed between fixed points on the cavity in one half of the die. Several factors tend to affect the relation of movable die parts to fixed die parts, and the relation of a point in one half of a die to point in the other half of the die. These factors therefore limit the degree of dimensional precision obtainable in a diecasting.

FIG. 8—Shrink porosity in an aluminum alloy diecasting which was eliminated by increasing the applied pressure from 15,000 to 30,000 psi. Note excessive flashback (at arrow) about the ejector pin.



Dimensional precision is occasionally affected adversely by the inability of a diecasting machine to hold the die halves perfectly closed during the injection interval, or by the failure of a core pulling device to return the core to its proper position when the die is closed.

Occasionally a core is long and of small diameter. When such a core is struck by the incoming molten alloy ray, the core will gradually become bent and the dimensions of the diecasting related to this core will be thrown off.

Despite the fact that the steel die is rigid and inflexible, it may nevertheless wash out of shape, i.e., molten alloy literally washes away a portion of the die cavity surface and thereby creates a dimensional change. Such die cavity washout is generally localized to those areas where the molten alloy ray impinges directly on the die cavity surface, or wherever the molten alloy ray flows at high velocity over the die cavity surface.

Thermal Expansion—The diecasting die, upon being heated, tends to expand, and in certain areas and locations does, while in certain other locations this tendency to expand does not result

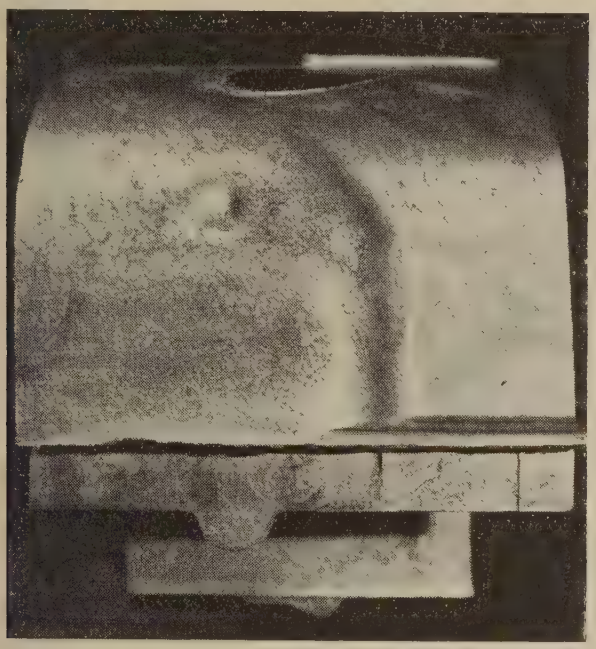


FIG. 9—Typical surface depression in an aluminum alloy diecasting which was eliminated by water cooling a thick boss just beneath the area where the depression occurred.

in an actual expansion or change of dimension in the die because the force tending to expand the die is insufficient to overcome other forces tending to hold these portions rigidly in place. The degree of the die's thermal expansion is dependent upon the shape of the die cavity (not all parts of the die cavity expand to the same degree due to the confining forces of the geometrical design of the die which tend to hold certain portions of the die cavity rigidly in place), the temperature of the diecasting alloy, the rate of the diecasting cycle, the thermodynamic properties of the die steel and the casting alloy, and the die cooling system, etc.

The diecasting die cavity seldom reaches a

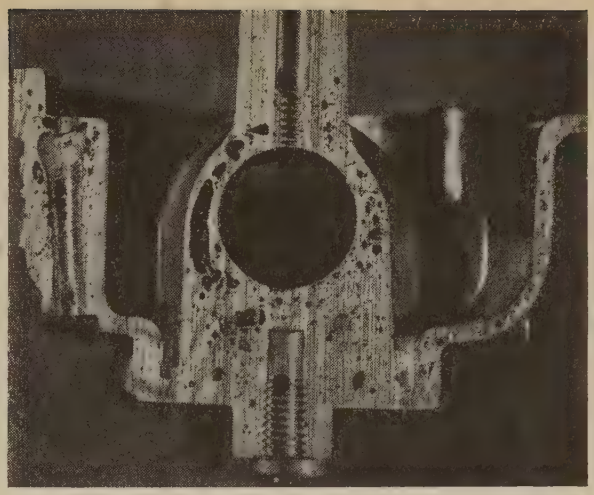


FIG. 10—This aluminum diecasting illustrates the consequences of too low an injection speed. Raising the injection speed from 100 to 400 fpm eliminated the porosity and produced pressure tight castings.

uniform temperature throughout. Actually one portion of the die cavity will be hotter than another in service. Whether this is a desirable or undesirable condition depends entirely upon whether undesirable irregularities are manifest in the diecasting. Frequently a *very ununiform* or even a *very uniform* temperature condition in the die cavity engenders unwanted irregularities. When this happens, steps have to be taken to cool one portion of the die cavity or to heat another.

Shrinkage—In order to assure that the dimensions of a diecasting will be those specified by its designer, careful consideration must be given to the shrinkage of the casting alloy to be used, for unless this unavoidable shrinkage is taken into account in building the die, the castings will not possess the dimensions called for in the part blueprint.

Each alloy has its own characteristic degree of shrinkage—first, as it cools in the liquid state; second, while it changes state (from liquid to solid), and, third, as it cools in the solid state. Those particular alloys which are host to a high degree of shrinkage are least suitable for the production of diecastings. When a given alloy tends to shrink a great deal, while it is in the liquid phase and cooling, this definitely sets a limit on the temperature at which this alloy should be forced into the die cavity. High liquid shrink is a disadvantage because occasionally it is necesary, or at least desirable, to employ a molten alloy which is at a comparatively high temperature in order to make sound diecastings. This is especially true for very large complicated, thin walled castings, viz. 5 lb. Also when a given casting alloy possesses a large shrink on passing from the liquid to the solid state or in cooling down in the solid state, this too is a disadvantage to the diecaster because it is not always possible to compensate in the design of the die for this high shrinkage. In the case of some aluminum base alloys, which possess this high shrink, certain diecasting designs are ruled out. Also, it is not always possible to make diecastings, whose designs do not permit the use of large drafts, out of alloys that possess a high shrink, because these alloys have a tendency to

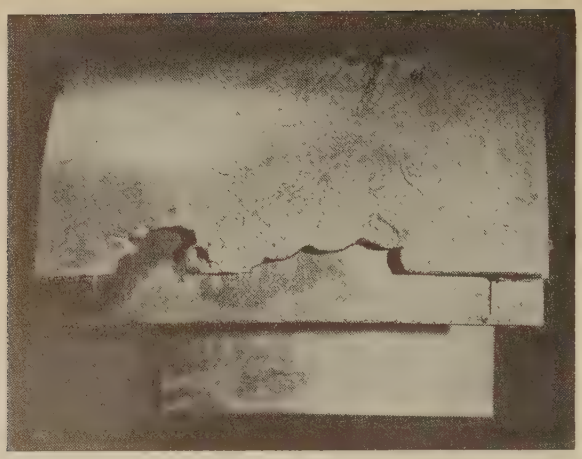


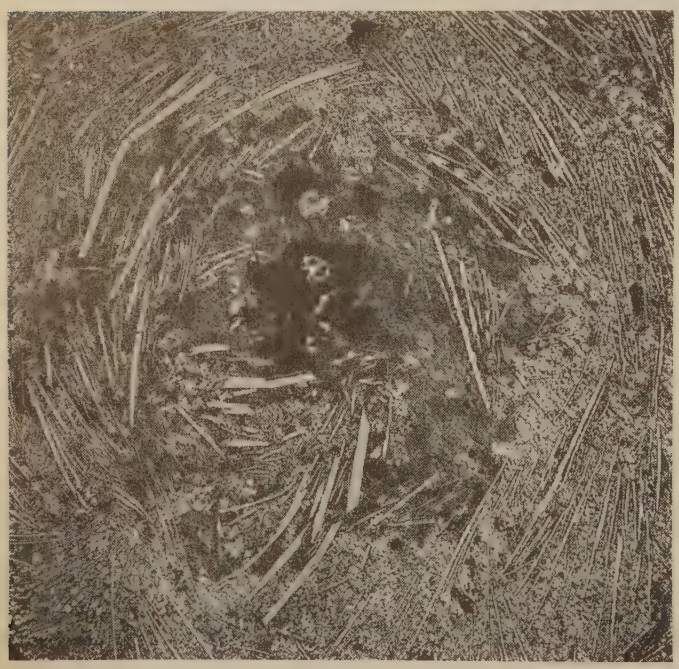
FIG. 11—A portion of the diecasting shown here has not filled completely. In this instance, the alloy solidified before it filled the diecasting.

stick or seize onto cores where there is insufficient draft.

One of the present day binary-type aluminum alloys, the Al-Si type, is considered an excellent diecasting alloy because with increasing silicon content up to the eutectic, and even beyond, the tendency of this alloy to shrink on solidification decreases.

As an alloy shrinks, it tends to occupy less space. This means that while a given alloy may fill a die cavity completely while it is liquid, it may not fill it once it has solidified. In the case of a diecasting, this means that the casting will not, when cooled, possess exactly the same dimensions as the die cavity, but will occupy less volume. Therefore, in constructing diecasting dies the degree of shrink of a casting alloy must be taken carefully into consideration.

FIG. 12—A classic photomicrograph showing needle crystals of β (FeSi). Their circular orientation with the lines of metal flow indicates that they were present before the alloy ceased flowing into the die cavity. Note the air trapped in the center of the swirl. 100X



It is true that although a given alloy shrinks as its temperature falls, it may be prevented from doing so by the confining rigidity of the die steel. Such hindrance as is offered by the steel die may set up internal stresses within the casting itself which later cause trouble during machining or finishing by altering the shape of the casting when the stresses are relieved, or when the diecasting is too weak to withstand the tendency of the stresses to deform it.

In designing the die, recognition must be made of the fact that a certain amount of play is unavoidable in movable cores, slides, etc. If these movable parts are to have the necessary freedom of movement, the presence of this necessary play in the movable components of the die eliminates the possibility of maintaining a dimension between these movable parts and other fixed points in the die block to as close a tolerance as is possible to hold between points in a given half that lie in nonmovable portions.

As soon as moving cores, locking devices, bolts, wedges, guides, pivots, etc., wear or become loose, dimensions between them and other points will become altered. Wear, rubbing, or uneven thermal expansion in cores, slides, etc. tend to change certain dimensions of the diecasting.

Diecastings made of certain alloys may possess the specified dimensions just after they have cooled to room temperature, and yet days later exhibit unacceptable dimensions. This change of dimension with time may be due to the aging of the casting alloy. Aging accompanied by dimensional change may give rise to dimensional irregularities.

Irregularities Affecting Mechanical Properties

Irregularities affecting mechanical properties are internal and external porosity, cracks, microshrinkage, inclusions, cold-shuts, deep-seam-lines, oxide inclusions, and improper chemical compositions. Occasionally a heterogeneous microstructure (as opposed to macrostructure) is an indication of a defectively produced diecasting.

Porosity in a diecasting may be engendered in any one of several ways. However, there are only three main types of porosity—shrinkage, gas, and incomplete fill. Each of these types is caused differently and gives rise to a characteristic pattern. The most disastrous type of porosity is that caused by shrinkage because this variety manifests itself in the form of jagged, sharp-cornered, internal cavities.

Internal porosity tends to lessen the overall density of a diecasting and to localize stresses. Frequently it indicates the presence of an inferior microstructure. It also reduces impact strength, ductility and fatigue strength. When such internal porosity is connected by intercrystalline channels to the surface, it seriously reduces corrosion resistance, handicaps the electroplater, and reduces the plate-life.

Shrinkage Porosity — Shrinkage porosity is caused by a decrease in the volume of the casting alloy as it cools. The degree of this decrease in volume is related to the chemical composition of the casting alloy and its initial casting temperature. As the molten alloy in a die cavity cools it shrinks, and unless this shrinkage is compensated for by an influx of additional molten

alloy, the shrinkage may foster internal (subsurface porosity is considered here to be internal porosity) or even external porosity (surface depressions). Fig. 8 illustrates typical shrink porosity as found in aluminum alloy diecastings. The porosity shown in fig. 8 was eliminated by increasing the applied pressure from 15,000 to 30,000 psi. Whether it is the internal or external type of porosity that develops depends upon whether or not the alloy solidifies from the outside in, or whether, especially in the case of thin sections, a hot spot, located on the die cavity wall on one side of the die, causes the alloy to solidify entirely progressively from one wall to the opposite wall. This means that the metal adjacent to the latter wall solidifies last and in so doing produces a surface depression adjacent to the die cavity surface which is excessively hot. Both internal and external types are undesirable. Occasionally, however, the presence of one is of little consequence. On the whole the service conditions dictate which type of porosity is the most undesirable.

Surface Depressions — Surface depressions, such as shown in fig. 9, on the surface of a diecasting affect its mechanical strength in proportion to their depth of penetration into the diecasting. Very deep surface depressions even with small cross-sectional areas are the most detrimental to mechanical strength.

The occurrence of shrinkage porosity is best combated by changing either the diecasting conditions or by altering the design of the die in order to facilitate the proper feeding of the area of greatest shrinkage, or to eliminate the area of shrinkage altogether.

Shrinkage areas most frequently occur where there is a change in the section thickness, viz., where a thick and thin section join. Here the thin section solidifies first and draws liquid alloy away from the thicker section. Shrinkage porosity also tends to occur where there are localized overheated areas on the die cavity surface, as previously mentioned. These frequently can be eliminated by either relocating the water lines or adding water lines, or by regating, or by reventing, or by decreasing the velocity of the incoming molten alloy stream that passes over the overheated area.

Microshrinkage Porosity — The presence of microshrinkage in magnesium alloy diecastings decreases appreciably the mechanical strength properties of such castings.

Trapped Air Porosity — Porosity resulting from the entrapment of air is peculiar to improperly made diecastings[6]. However, a certain amount occasionally occurs in the best diecastings. Of all the types of porosity, this type is the most easily combated. It occurs whenever the air present in the injection well and die cavity is prevented from escaping through the vents or air escape passages. The desired escape of the air in the injection well and die cavity is most generally prevented by a sealing-off of the vents by the initial influx of molten alloy.

Certain diecasters are of the opinion that the best way to eliminate, or rather to avoid, trapped air porosity is to employ large gates, slow injection rates, and high after-pressure. These conditions, they contend, give the air present in the injection well and die cavity time to escape through the vents before these vents are sealed-off by the incoming molten alloy. Other diecasters resort to the use of overflows to get the confined air out of the die cavity proper. Into these overflows they literally wash the confined air out of the critical area in the die into the noncritical overflow.

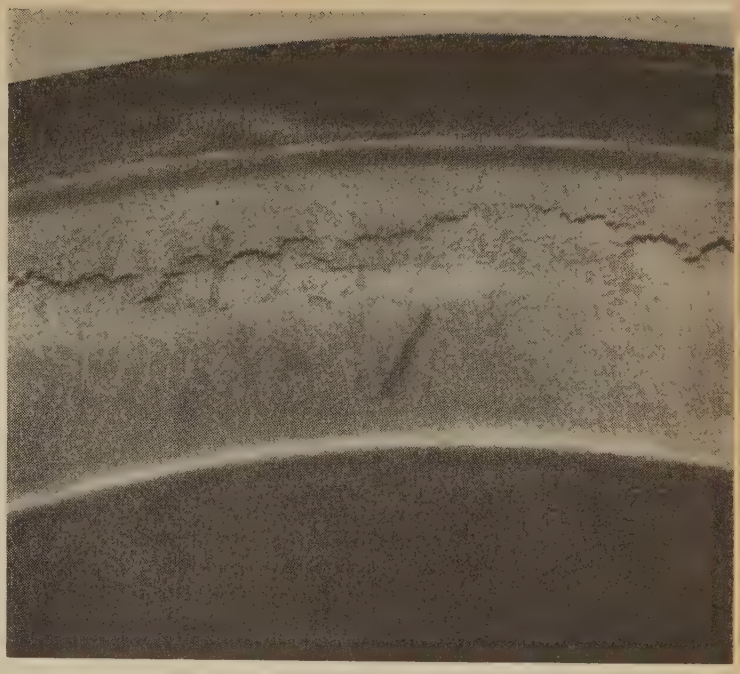
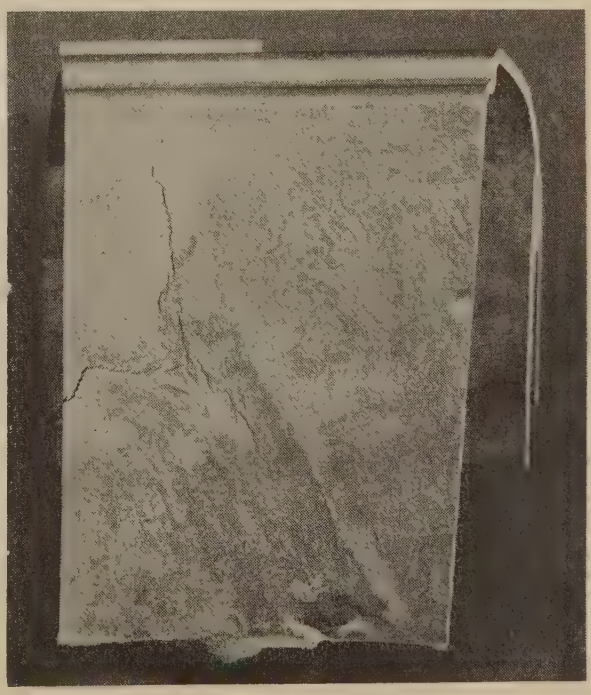


FIG. 13—A crack in the surface of an aluminum alloy diecasting caused by a bending stress created by uneven ejection of the casting from the die cavity.

Incomplete-Fill Porosity—By far a majority of all internal porosity in diecastings is caused

FIG. 14—These cracks in the wall of a thin-walled aluminum alloy diecasting are located in the path of the incoming metal flow. Altering the gate, increasing wall thickness and increasing the die temperature eliminated this defect.



by failure of the incoming molten alloy to fill properly the die cavity. Unfortunately porosity of this origin is often considered to be caused by trapped air. Actual difference between the two is: In the case of trapped air porosity, the back-pressure of the trapped air prevents the proper filling of the die cavity, while in the case of the incomplete-fill, porosity results when a portion of the die cavity just does not get filled, because of some other factor, viz., not sufficient pressure. Figs. 10 and 11 illustrate these types of porosity. The incomplete-fill porosity is easily eliminated by regating or by adding overflows to alter the flow of the molten alloy within the die cavity.

Evolved Gas Porosity—Occasionally porosity is formed within a diecasting as a consequence of the evolution of dissolved gas in the molten alloy[7]. This type of porosity generally occurs in the form of tiny pores and is best eliminated by the use of a gas free metal and/or by making certain all the alloy that fills the die cavity solidifies under the influence of the applied pressure.

Created-Gas Porosity—Frequently porosity may be formed as a result of the release of gases from die coats or die lubricants as these latter two substances are contacted by the molten alloy. Porosity formed in this manner generally is of the spongy type. Its occurrence is best eliminated by the discontinuance of the use of the die coat or lubricant.

Surface depressions are actually external cavities. They may be formed in several ways; by the creation of a vacuum in the inside of the diecasting, by the presence of trapped air between the die cavity wall and the diecasting alloy, by the incomplete filling of the die cavity by the molten alloy during the die filling interval, and/or by shrinkage of metal in the casting interior.

When a depression is formed on the surface of a casting due to the overheating of the die, its occurrence usually can be eliminated by decreasing the die temperature at the point where the caved-in-area is located (this latter is most easily accomplished by water cooling the die, or by changing the direction of the molten alloy flow), or by changing the design of the casting.

If the surface depression is caused by the formation of a vacuum in the interior of the casting, then its occurrence can be corrected by methods similar to those employed in the case when the caved-in-area is caused by a localized hot spot on the die cavity surface. Occasionally a vacuum spot is formed within the die cavity in an area around a core, or near a corner, or is formed by the flow of the incoming molten alloy stream. In this case the gating or venting should be altered to eliminate the vacuum spot.

Chemical Composition—Chemical composition of the casting alloy is an important factor contributing to the mechanical properties of a diecasting. However, since it is not generally the foreman's responsibility to control the chemical analysis of the casting alloys he employs, it need only be mentioned here that he should guard against iron pickup in connection with aluminum diecasting alloys (see fig. 12), the contamination of zinc diecasting alloys by lead and tin, and the contamination of magnesium alloys by copper and nickel[8].

Microstructure—The microstructure of a diecasting is dependent upon several factors. It is dependent, for example, upon the chemical analysis of the diecasting alloy, upon the rate of cooling of this alloy, upon the degree of turbulence to which this alloy is subjected during the interval in which it changes state, upon the degree to which the air present in the die cavity is mixed with this alloy during the interval in which the alloy changes state, and upon the magnitude of the pressure applied to this alloy during the interval in which the alloy changes state. Because so many factors play a role in determining the microstructure of a diecasting, there will be in any large complex diecasting differences in the casting's microstructure from area to area in its interior.

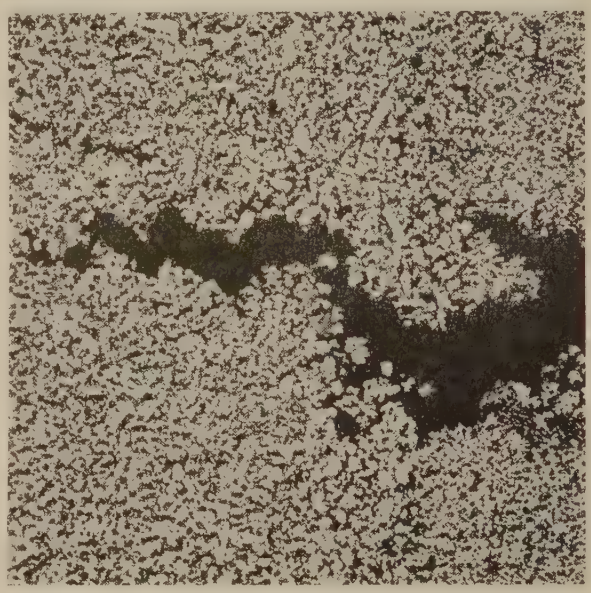


FIG. 15—Photomicrograph of a portion of a hot-short crack in a magnesium Dow R alloy diecasting. 100X

A very definite relationship exists between the casting's microstructure and its mechanical strength. Inferior microstructure means inferior mechanical properties. Bear in mind that a very excellent method of diagnosing casting troubles is to be had in the use of metallography which can reveal many significant facts about the soundness of a plant's entire diecasting technique.

Cracks—Not all the cracks found in diecastings are caused by shrinkage. Occasionally cracks are caused by uneven ejection of a diecasting from the die. There may be a slight undercut on a core or in the cavity which prevents the normal ejection of the diecasting from the die cavity; or occasionally certain ejector pins do not come into play at the precise moment others do and consequently a stress is set up in a diecasting sufficient to rupture it, as shown in fig. 13. Cracks may of course also be caused by irregularities in the wall thickness, or by irregularities in cooling.

Too, cracks may be caused by insufficient draft. Wherever there is too little draft, the ejection

system has to apply excessive pressure in order to push the diecasting out of the die cavity, and in doing this it frequently cracks the diecasting.

The most common type of crack is, however, the one caused by metal shrinkage. Here internal stresses are set up in the alloy during the interval in which it changes state or during the interval in which it cools in the solid state. The latter type of internal stresses develop when one portion of alloy cools before another, giving rise to the situation shown in fig. 14, or when the die has been improperly designed, and/or when normal shrinkage is prevented from occurring by the inflexible die cavity.

The cracks illustrated in fig. 14 are in the wall of a thin-walled aluminum diecasting and are located in the path of the incoming molten alloy flow. The die walls adjacent to this path of molten metal flow were heated during the casting of this part to the temperature of the incoming metal to a greater depth than the surrounding die wall. This condition, coupled with the fact that the last alloy to enter the die lay in this area, caused the alloy in this region to solidify last. This resulted in internal stresses being set up by the shrinkage of other previously cooled alloys, and ruptured the casting in this region where the elevated temperature strength was insufficient to withstand the shrinkage stresses generated. Altering the gate, increasing the wall thickness and the die temperature eliminated this defect.

The former type of internal stresses arise when one of the phases of the solidifying alloy is unable to withstand internal stress at elevated temperatures and consequently ruptures. A crack which originated in this manner is shown in fig. 15.

Irregularities Affecting Machinability

Although diecastings offer the advantage that they require less machining than either sand or permanent mold castings, they nevertheless frequently require some machining before assembly. If the diecastings are such that the required machining is made impossible at the estimated cost as a result of the presence of some irregularity, then the castings are rejectionable.

Such irregularities as hard spots, inclusions, cold shuts, and the presence of excessive, large primary silicon crystals in the aluminum diecasting alloy's matrix, for example, have an adverse effect on machinability (see fig. 16), and their presence in the alloy must be guarded against.

Hardspots and Inclusions—Hardspots are caused by the presence of undissolved inclusions such as oxides, nitrides, carbides, and silicides, i. e., chemical compounds formed by the union of one of the constituents in the melt with one of the constituents present for example in the atmosphere. The flux, the holding pot, the holding pot coating, the die coat, the die lubricant, an oil or grease, a careless contamination—that is, any compounds which are insoluble or which have only limited solubility in the melt, are also possible causes. Fig. 17 illustrates a hardspot.

It is, on the whole, somewhat difficult to chemically analyze hardspots in view of their size. However, both microchemical and spectrographic analysis have been performed on hardspots observed by the author and their chemical nature qualitatively determined. Because hardspots generally occur as tiny fragments which are difficult to analyze, unless sufficient quantity is collected, many diecasters content themselves with the conviction that hardspots are merely "iron inclusions" or merely "refractory inclusions" while in reality their presence may be in no man-

ABOVE

FIG. 16—Photomicrograph of an aluminum alloy diecasting containing 12.93 pct Si which solidified at a comparatively slow rate. Note the presence of primary silicon crystals which hamper machining. 500X

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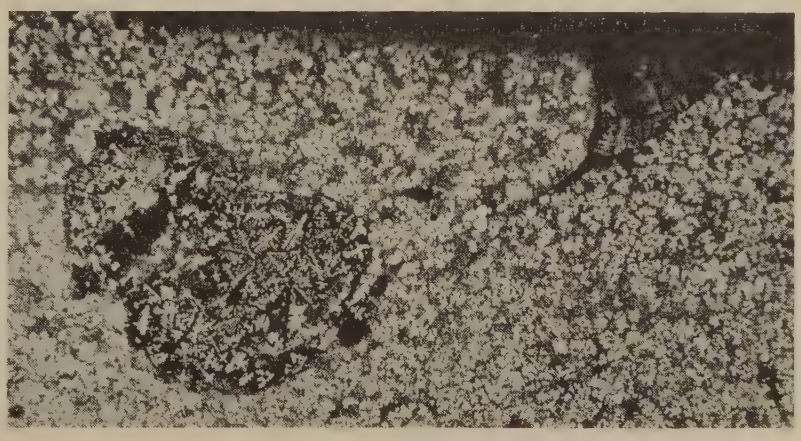


RIGHT

FIG. 17—Photomicrograph of two hardspots in a section of an aluminum alloy diecasting. One is on the surface, and one is in the underlying layers. 60X

ner related to either the iron content of the alloy or to the use of refractory crucibles or refractory lining.

Oxide Inclusions—Oxide inclusions may be created in one of two ways, (1) by the chemical union of one of the melt constituents with the oxygen in the atmosphere over the melt or with the water vapor in the atmosphere over the melt, or (2) by the chemical union of oxygen released either mechanically or chemically from a material within the melt or with which the melt comes in contact. That is, the melt may react with the water of crystallization of the pot wash or flux, or it may react with the adsorbed water on the surface of solid metal introduced into the melt, or it may react with oxygen released by an impurity in a flux.

When the melt combines with the oxygen or water vapor in the atmosphere, the nature of the oxide is that of a film. If the melt is vigorously stirred, this oxide film is introduced into the melt where, due to surface tensional forces and because the specific gravity of the oxide is close to that of the melt, the oxide remains suspended. It does not dissolve since it is insoluble in the melt, and of course it does not melt because its melting point is never reached by the melt temperature.

References

[6] A detailed discussion of the effects of trapped air on mechanical properties can be found in "Pressure Diecastings," Light Metals, 1945, 8, 173.

[7] J. L. Erickson, "Degassing Aluminum and Its Alloys," Light Metal Age, July 1944.

[8] J. L. Erickson, "Little Recognized Factors Influencing the Quality of Aluminum Pressure Diecast Parts," Aluminum and Magnesium, May 1945.

Openhearth Steel with Oxygen

INCREASED openhearth steel ingot production through the use of oxygen has caused many mills to carry on intensive test programs during the past year to properly evaluate oxygen utilization. In a paper presented before the annual AISE convention at Pittsburgh, J. H. Zimmerman, manager of development, Linde Air Products Co., summarized the present knowledge of this subject, based on results of more than 6000 heats in 34 shops.

Oxygen use in openhearth steel production falls into the categories of meltdown and decarburization and that used in practically all of the work described was of high purity and supplied through liquid oxygen distribution systems. For meltdown, chief interest was reported to be in the use of oxygen with oil or tar-fired end burners. These ranged in design from models using a low velocity oxygen annulus surrounding the steam atomized fuel jet to those using a supersonic velocity oxygen jet below and parallel to the fuel jet. By using oxygen in conjunction with the end burners, the author stated it was possible to increase the fuel rate while at the same time shortening the flame to such an extent that it will not go into the downtakes. With the oxygen under the fuel jet an area of higher flame temperature and greater radiation was obtained on the bottom side of the flame, while the top side of the flame which radiates to the roof was reported to be practically identical with normal firing conditions. Decrease in charge to tap time was said to have averaged 10 to 25 pct with a range of 400 to 750 cu ft of oxygen used per ton of steel. End burners were described as particularly valuable with high cold metal charges.

A second method for meltdown of scrap charge also in the process of development was described as involving the use of a supersonic velocity of oxygen stream to oxidize a small portion of preheated scrap. This oxidization resulted in an endothermic reaction, providing sufficient heat to melt adjacent scrap. A third method which the author described consisted of introducing oxygen into the checkers to enrich the air blast. Results were said to be inconclusive. The use of auxiliary oxygen-fuel burners for scrap meltdown was tried on a limited basis and, while indicating that reductions can be effected in charge melting times, also revealed that further development of this method will depend upon design of practical means for mounting and mechanizing burners for roof, backwall, or frontwall operation. Oxygen for decarburization was accomplished by use of consumable lance pipe or a non-consumable water-cooled jet device. Rates of carbon reduction obtained were said to be approximately the same, although it was stated the non-combustible device can be better adapted to mechanization of the process.

New High Temperature Material

A very hard material that is said to retain its strength and resistance to corrosion at high temperatures has been developed by Kennametal, Inc., Latrobe, Pa. This special cemented carbide composition—called Grade K138—is manufactured by processes similar to those employed in making the carbides used for cutting tools and wear-resistant parts, but features some unusual properties. It is said to withstand temperatures that rapidly destroy conventional carbides and the best cast alloys; to resist thermal shock better than ceramics; and to have a specific gravity about one-third that of tungsten carbide.

Pieces of Grade K138 are said to have been heated to 2100°F for 48 hr without loss of strength. Neither does the strength change appreciably when heated to 1800°F and quenched in water. Air cooling from the same high temperature leaves no effect other than initial discoloration of the surface.

This new heat-resistant material consists essentially of titanium carbide with cobalt as the bonding element. The titanium carbide has heretofore been used only as a minor ingredient of cutting tool alloys. Grade K138 can be formed into a great variety of shapes and sizes, with tolerances and finishes common to conventional cemented carbides.

New Equipment . . .

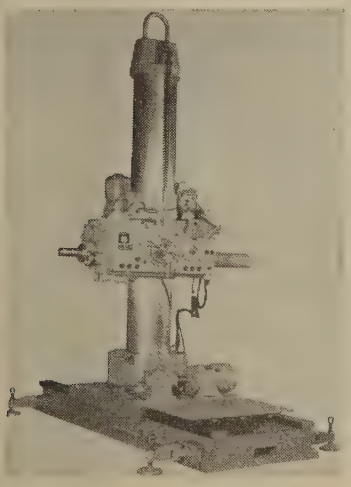
A drilling and tapping machine with a tilting horizontal head, a special lathe for polishing rubber printing rollers as well as for metal turning, a riveting hammer for sheet metal work, and a grinding coolant unit are described in this issue. Pin-type flexible couplings, a welding torch holder for straight line cutting, and bi-metal wire are other items discussed.

ndustrial AC Welders

A SMALLER designed Flexarc industrial line of ac welders s available from *Westinghouse Electric Corp.*, P.O. Box 868, Pittsurgh 30. A sturdy, compact, treamlined case and a well arranged interior with reactor and ransformer built around high ermeability Hipersil steel cores re features of the welders. High rc stability is said to be assured n the lowest as well as the highest urrent ranges of the five output atings 200, 300, 400, 500 and a uplex 300/600 amp. Heavy duty asters for portability and strap kid mounting on stationary units re provided.

Drilling and Tapping Machine

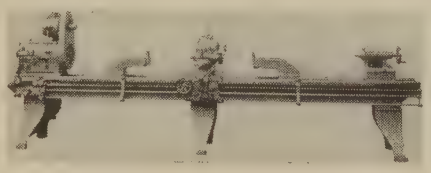
A PORTABLE horizontal drilling and tapping machine with tilting horizontal head for an unimited number of drilling and tapping operations has been designed y *Kaukauna Machine Corp.*, Kauauna, Wis. Full three-dimensional ower traverse and swiveling of he headstock provide for drilling nd tapping operations throughout



he range of 45°, above or below he horizontal spindle position, and he column rotates 360° on its subase. Other features are fine feed through micrometer handwheel; adjustable calibrated depth gage with automatic trip to throw out feed at any predetermined depth within 6 in. of spindle travel; single lever control for three feeds; rotary selector lever with dial for tapping to a depth of 5 in.; and selector switch for right or left spindle rotation. The machine has a capacity of 3 in. in cast iron with a 3-in. diam spindle, 9 spindle speeds, 3 spindle feeds, and a 24-in. longitudinal continuous travel of spindle and a 48-in. horizontal travel of column on runway.

Special Purpose Lathe

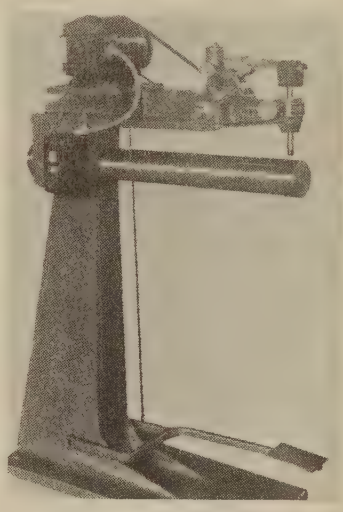
A TWO-PURPOSE lathe which not only polishes rubber printing rollers on a production basis, but also performs standard engine lathe metal turning as well, has been announced by *R. K. LeBlond*



Machine Tool Co., Cincinnati 8. Known as the Regal rubber roller polishing machine, this lathe is used to service rubber rollers, maintaining a highly polished surface and uniform diameter throughout the length of the roller. When not used for polishing, the lathe is readily adaptable to regular metal working operations. Regals are available in 6 swing sizes from 13 to 24 in. The polishing machine is built on the 19 in. model. Regals are built with eight-speed geared headstock, quick change box, leadscrew, and feed rod. Complete motor drive is furnished as standard equipment.

Riveting Hammer

FOR industries requiring special riveting equipment, a high-speed hammer has been placed on the market by *High Speed Hammer Co., Inc.*, Rochester 5, N. Y. This machine has a 24-in. long steel arbor and is designed particularly



for sheet metal work. While the unit has a capacity of from ⅛ to ¼-in. diam rivets, units having greater or lesser capacities are available.

Power Brushing Machine

DESIGNED jointly by *Monmouth Product Co.*, Carnegie Ave., and *Osborn Mfg. Co.*, Hamilton St., Cleveland, a semi-automatic power brushing machine has been constructed to remove oil, grease and dirt from automobile and truck clutch plates prior to final inspection. This machine operates in conjunction with a revolving turntable which is synchronized with the production of an adjoining punch press. Projecting upward from the turntable are six stations in the form of spindles, upon which the punch press operator places the clutch plates for cleaning and inspection. The turntable rotates at the rate of 2 rpm, carrying the plates, one station at a time, to the location of the power brushes which are mounted above and below the turntable. These 12-in. diam

brush sections filled with untreated Tampico fiber complete the cleaning operation by a combination spinning and brushing action.

Electric Heater

SPECIAL purpose four-station resistance electric heater designed to accommodate knee action control arms, prior to forging operation, has been completed by *Agnew Electric Co.*, Milford, Mich. The cycle of operation is automatic except for loading and unloading. Placing the part in position starts the automatic cycle: high pressure clamping accomplished hydraulically; photoelectric control of the heating; part automatically unclamped at end of the heat time. The machine is rated at 1000

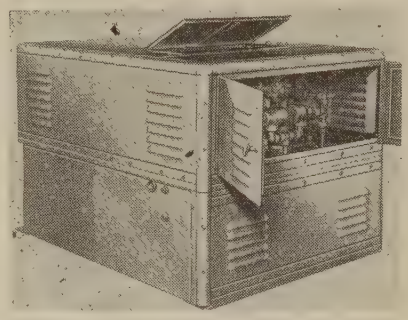
heated pieces per hr with one operator. Emergency stop buttons are provided to break cycle of operations on any one of the four stations.

Booster Fans

A SERIES of booster fans for use in paint spray booths and for removal of fumes and excessive heat have been announced by *Chelsea Fan & Blower Co., Inc.*, 1200 Grove St., Irvington, N. J. These fans are available in five sizes with capacities ranging from 2000 cfm with a 16-in. diam propeller to 9500 cfm with a 36-in. diam propeller. Rugged construction and quiet operation are claimed for these fans. Fan shafts and motors are ball bearing mounted and blades are made of nonferrous metal. The 2000 and 2500 cfm units are powered with ¼-hp motors, the 4400 cfm with a 1/3-hp motor and the 7400 and 9500 cfm units with ½-hp motors.

Hydraulic Power Units

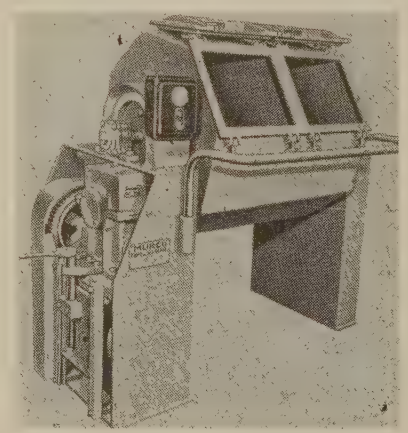
FOR special installation requirements, *Vickers, Inc.*, 1420 Oakman Blvd., Detroit 32, offers to the industrial machinery field custom built hydraulic power units, which can be individually designed to include all necessary pumps, valves, intermediate piping, oil reservoir, motors and controls in a selfcontained unit. Hydraulic accessories such as oil filters, air cleaners, oil level gages and fittings are also



included. Hydraulic connections to the machine are grouped in a manifold, which is said to simplify design and reduce installation and maintenance costs. Pump and motor may be connected directly by a flexible coupling, eliminating the need for drive mechanisms.

Tumbling Barrel

THE new Murco tumbling barrel designed to deburr, burnish, clean, polish and smooth-surface metal and plastic parts on a mass production basis, has been announced by *D. J. Murray Mfg. Co.*, Wausau, Wis. The unit is compact, with streamlined appearance and features speed changes which may be made while the barrel is in motion. Specially designed dump



pans are mounted on casters and are provided with bail handle notched for a crane hook. Separating screens of various mesh wire can be mounted in frames to fit the dump pans. All moving parts are protected with guard rail, steel enclosures, and concealed design for safety of operation.

Cleaning Machine

REDESIGNED models of the line of Aja-Dip cleaning machines have been announced by the Equipment Div., *Magnus Chemical Co., Inc.*, Garwood, N. J. The outward appearance has been streamlined, with grouped control and instrument panel. Drive mechanism is located in the front of the machine. In use, positive, fast cleaning is obtained by mechanically raising and lowering the platform containing the dirty parts 60 times per min through the cleaning solution with an 8-in. vertical stroke. This is said to impart a shearing action to the cleaning solution. Cleaning with the Aja-Dip machines is fully automatic, requiring labor only for loading and unloading. Machines are available in 13

sizes and types from the Midget handling a few pounds of work to the Jumbo type handling 2200 lb at a time. They may be used with either hot or cold cleaning solutions. If heated, heat may be by steam, electricity, oil, gas or kerosene.

Stainless Steel Electrodes

A LINE of stainless steel electrodes in a full range of grades and diameters has been introduced by the Electric Welding Div., *General Electric Co.*, Schenectady 5. The electrodes are available in two types of coatings, one designed for ac or dc use, and the other for reverse polarity dc operation. They can be used in all welding positions. Stability of the arc and deposition characteristics are said to assure flat fillet welds. The electrodes are furnished in standard packages of 25-lb in 1/16, 5/64 and 3/32-in. sizes, and in 50-lb packages in ⅛, 5/32, 3/16, and ¼-in. sizes.

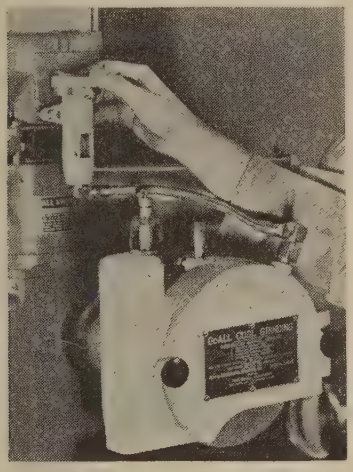
Bi-Metal Wire

ELECTROPLATED and drawn wire which can be bent, swaged, hammered, woven or twisted without flaking, has been announced by *Kenmore Metal Corp.*, Warren, Pa. In the manufac-

ture of this wire which is tradenamed Fernicklon, metal rods of ¼ in. diam are electroplated continuously and then cold-drawn to diameters as fine as 0.0038 in. It is stated that one inch of ¼-in. plated rod may produce as much as 100,000 ft of plated wire, permitting it to be ordered in continuous sections of almost any length. Die polish or satin finishes are available. The wire can be welded to form a product without destroying the coating at the point of the weld, the manufacturer states.

Grinding Coolant Unit

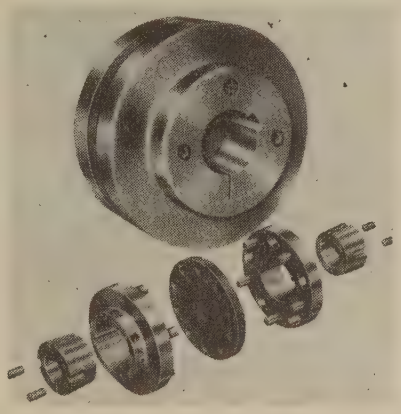
FOR cooling work in grinding, a unit which is said to offer the benefits of dry grinding visibility with adequate cooling of the work has been announced by the *DoAll Co.*, Des Plaines, Ill. The unit con-



sists of a coolant reservoir mounted on the spindle column, a sight drip valve and a special wheel adapter. The coolant is fed from the reservoir at a rate of from one to four drops a second, depending upon the material ground, and is directed into the front of a special wheel adapter where it enters the arbor hole of the grinding wheel. As the grinding wheels used in this process have no lead or ceramic, the coolant enters the wheel at the inside and is thrown by centrifugal force to the outside grinding face. The coolant introduced in this manner is said to flush the grinding surface. The unit is available for DoAll 6 x 18-in. surface grinders.

Flexible Coupling

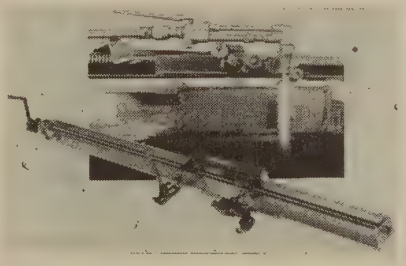
A PIN-TYPE flexible coupling incorporating the Taper-Lock bushing has been announced by *Dodge Mfg. Corp.*, Mishawaka, Ind. The use of this taper lock type bushing in the coupling is reported to insure fastening to shaft with firmness of shrink fit and makes reboring unnecessary. The center disk is of oak tanned sole leather providing flexibility, resiliency and



strength. The center disk can be removed, it is said, by loosening coupling flanges and sliding them apart on shafts and the large diameter centerless ground pins which are pressed into the flanges can be easily renewed. The coupling is machined all over to insure balance and true running. It is said to be easy to install and remove and can be disconnected without moving coupled machines.

Welding Torch Holder

KNOWN as the C & H straight line cutter, a screw feed device which holds a welding torch and feeds it along a straight line has been designed by *J. A. Campbell Co.*, 645 E. Wardlow Rd.,



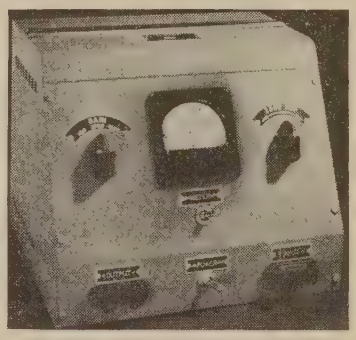
Long Beach 7, Calif. It has an adjustable holder so the torch can be angled to cut bevel or scarf. It has a positive feed so that the operator can direct the torch along a straight line as slowly or as fast as desired. A stainless steel wheel rolling along the work keeps the torch at a uniform distance from the work. The torch is said to make perfectly square cut-offs of plates, rods and bars. The cutter is 5 ft in length and weighs 42 lb.

Electrode for Cast Iron

AN electrode for welding cast iron where the weld must be machinable has been announced by *General Electric Co.*, Schenectady 5. Designated W-2075, the electrode is composed of pure nickel core wire and an extruded black covering which is said to be largely consumed in the arc and produces very little slag. The arc stabilizing ingredients used in the covering make this electrode useful on ac and dc (reverse polarity).

DC Amplifier

IN their Microsen amplifier, an instrument which measures and amplifies minute power impulses as low as 0.2 mv, *Manning, Maxwell & Moore, Inc.*, Bridgeport 2, Conn., introduces a principle which is designed to make possible a combination of sensitivity and stability in a



laboratory instrument. Power inputs from ironization, photoelectric cells, thermocouples, or a Wheatstone Bridge are amplified by means of an electro-mechanical balance, giving an output signal directly proportional to the input signal. Input is measured and output stabilized through a feedback circuit. The instrument incorporates a mechanical zero adjustment with sufficient range to permit operation from various reference voltages, an adjustable gain, no lower frequency limit, and low input resistance.

Plastic Lined Pipe

PLASTIC lined steel pipe has been developed by Amercoat Div., *American Pipe & Construction Co.*, P.O. Box 3428, Los Angeles 54, to permit the handling of strong chemicals. It is said to combine the structural strength of steel with the chemical resistance of Vinyl resins. Vinyl resins are compounded with chemical resistant pigments and plasticizers and are

then extruded in the form of a tube, which is placed inside a steel pipe and bonded to it. The tube is flared out over the flanges providing a continuous chemically resistant liner throughout the entire piping system.

Electric Impact Tool

AN electric impact tool announced by *Ingersoll-Rand,* 11 Broadway, New York 4, is an electrically powered all-purpose tool, which will, it is said, apply and remove nuts, drill, ream, tap, drive and remove screws and studs, run wire brushes, do hole saw work, extract broken cap screws and studs, drill brick and masonry, and drive wood augers. The tool runs on 110 v ac-dc, features forward or reverse speed at 1900-2000 rpm, and 1900 impacts per min.

Ball Bushings

DEVELOPMENT of an unlimited travel, antifriction ball bearing for linear or reciprocating motion has been announced by *Thomson Industries, Inc.,* 1029 Plandome Rd., Manhasset, N. Y. These bearings, called series A ball bushings, are selfcontained units consisting of three basic parts in addition to the balls: a sleeve made of 52100 ball bearing steel, a pressed steel retainer which is fabricated in continuous strips cut off and rolled up to fit inside the sleeve, and a pair of rings which are pressed in the ends of the sleeve to position and secure the retainer to the sleeve. These bushings are available for shafts having ¼, ½, ¾ and 1 in. diam. They are said to have a low friction coefficient to prevent cocking and binding.

Thread Compound

SAID to prevent freezing and galling of metal surfaces at temperatures as high as 1800° F, Hi-Temp thread compound has been released by *Felt Products Mfg. Co.,* 1504 Carroll Ave., Chicago 7. This compound has been developed specifically for high temperature and high pressure applications, such as furnace tube header studs and plugs and its use is said to eliminate stud breakage.

Rubber Belt

KNOWN as the Gilmer timing belt, a belt with rubber teeth that will not slip has been announced by *U. S. Rubber Co.,* Rockefeller Center, New York. The belt is said to be strong, highly flexible and virtually noiseless in operation and has been designed for use on machinery equipped with special

pulleys grooved to fit the teeth. It is reinforced with steel cables embedded in oil-resisting synthetic rubber. The cables reduce stretch almost to zero, eliminating the necessity of take-up devices, it is reported. In operation, the belt makes positive engagement with the pulleys at any speed ranging from a snail's pace to 10,000 fpm. It is suitable for power transmission and synchronization.

Electronic Servo System

AN automatic electronic remote control and positioning unit for the control of valves, dampers and other mechanical mechanisms has been announced by *Askania Regulator Co.,* 240 E. Ontario St., Chicago 11. Three basic units make the complete system: a transmitter from which point any desired position of a remote receiver can be selected, a control amplifier which responds to the setting of the transmitter and accordingly controls the supply of power to the receiver, and a receiver which moves a load to the selected position. The system is constructed for heavy duty use. Plug type connections are used where possible and signal lamps and/or audible warning signals are available to indicate position and direction of travel of the controlled equipment.

Hand Truck

CONSTRUCTED of high carbon tubing with all welded design, a drum and barrel truck has been added to the line of hand trucks produced by *Tubar Bending & Mfg. Co.,* 3901 Lakeside Ave., Cleveland 14. It is said this truck will handle any size barrel or keg without lifting the barrel by hand to insert nose under the barrel. The truck is 54 in. long x 22 in. wide; has 8 x 2-in. wheels, rubber tired roller bearing or steel wheels, plain or roller bearing. 10 or 12-in. wheels can be furnished. Weight is approx 45 lb, capacity 1500 lb.

Brake Lining Adhesive

CALLED Plastilock 601, an adhesive said to have more than twice the shear-resistance strength of brass rivets in anchoring automotive brake linings and eliminates danger of rivet scoring of brake drums has been developed by *B. F. Goodrich Co.,* Akron, Ohio. The material is synthetic and is available in either tape form or liquid. It is said the brake lining can be worn down to the shoe before need for replacing.

Coolant Pump

INCORPORATING several new features, a gusher coolant pump, model 11029, has been placed on the market by *Ruthman Machinery Co.,* 1809 Reading St., Cincinnati 2. The pump motor, totally enclosed type, is equipped with new style upper end bell having a large built-in conduit box, with ample capacity, it is said, to accommodate the multiple lead wires of dual voltage stators. Large precision sealed prelubricated ball bearings are used. Twin inlets, within the pump, are so arranged to provide hydrodynamic balance. All rotating parts are dynamically balanced by an electronic process. The pump can handle liquids containing reasonable amounts of grit and abrasives, as there are no metal to metal contacts within the submerged portion. Capacity of the pump, at 26-ft head, is 40 gpm with ½ hp motor, and 60 gpm with ¾ hp motor.

Pneumatic Transmitter

IDENTIFIED as model 42, an improved transmitter, announced by *Foxboro Co.,* Foxboro, Mass., for use in the pneumatic transmission of industrial process measurements such as flow, static or differential pressure, liquid level, temperature or humidity, is an indicator type instrument, available with either an eccentric or concentric scale. Transmitting and receiving mechanisms are matched and perfectly linear in calibration, resulting in improved accuracy, it is claimed. Simplified calibration is an advantage gained in the new design. A 12-in. case is used facilitating field service and providing room for additional units, such as alarm or signal devices, when desired.

MESTA

EAT TREATED SPECIAL ALLOY STEEL BACKING-UP ROLLS

Finishing a 49"x75" Backing-Up Roll in a Mesta Heavy Duty Roll Grinder

MESTA MACHINE COMPANY · PITTSBURGH, PA.

Assembly Line . . .

WALTER G. PATTON

• Auto output reaches highest level in '47 . . . Lincoln's new assembly line uses submerged levels to facilitate assembly operation . . . Kaiser-Frazer adds 1200 workers.

DETROIT — While automobile production continues at peak levels it is still an optimistic guess that 5 million vehicles will be turned out this year.

Through the week of Nov. 17 a total of 4,482,000 cars and trucks were assembled by U. S. and Canadian plants, according to *Automotive News*. With 24 production days remaining during 1947, car output will have to average about 21,600 per day for the remainder of the year. The present rate and the highest so far this year is 22,000 per day.

With Thanksgiving and Christmas holidays to think about, possible inventory shutdowns and steel shortages and the always noticeable lag caused by the exodus of more than 200,000 deer hunters, it seemed unlikely that the 5 million total would be reached although with very good luck 4,900,000 is a possibility. Most observers here will settle for 4,850,000.

Meanwhile, there are indications that available steel supplies are being crowded to meet the present demands. One major manufacturer has admitted that its inventory is being eaten into to such an extent that a new reduction in car schedules may be required to balance materials with assemblies. In the meantime, the fact that almost without exception steel buyers in Detroit are extremely pessimistic about steel supplies does not augur well for the crystal ball gazers who are still talking about 5 million cars and trucks in 1947.

Since last June, it is disclosed, Lincoln has been taking a series of major steps to modernize its final assembly lines. A changeover to its new facilities was made last month.

The new Lincoln line is more than 700 ft long and is considered one of the most modern in the industry. Generally speaking, the line is at floor levels but certain sections have been submerged to facilitate work. An example of this is the section of the line where the molding is attached to the side of the car.

Cars on the new Lincoln line ride on steel-flanged plates and subway gratings cover the submerged sections of the line. At some spots work goes on simultaneously underneath and on top of the car. According to Lincoln engineers, workmen now have much improved accesses to the working areas and lighting facilities have been greatly improved.

Some sources here are expecting that it will be less than 2 weeks until pilot models of the new Mercury will be coming down the new lines at the Lincoln plant. Large scale production should get underway during January. Barring the usual number of setbacks that invariably seem to delay the introduction of a new model car, the first Mercury models should hit the dealers' show rooms during February.

NOW that Walter Reuther has established full control over the turbulent UAW-CIO it would be nice to think that the auto industry can settle back with the comforting thought that it was done with factionism. However, sources close to the industry feel this would be only wishful thinking. It is being pointed out, for example, that the minority vote cast against Mr. Reuther was formidable, despite his clean sweep in placing men in top union offices. In Chicago and Flint, for example, Mr. Reuther's margin of victory was very slim indeed.

There are at present no indications that groups such as these will take the Reuther victory lying down. Many sizable minorities in the UAW are expected to oppos Mr. Reuther bitterly in the month ahead. If strong minorities be come, as some have predicted, cen ters for activity against Mr. Reu ther, the auto industry may stil have a lot of labor factionism t contend with.

Meanwhile, informed sources her believe Mr. Reuther will use his vic tory to renew his campaign for in dustry-wide bargaining. At th outset government representative may be asked to join with indus trial representatives at those bar gaining meetings. While industr is not likely to be a *willing* part o any such arrangements, the pres sures that will be brought by th union on government and busines are likely to be severe. If the unio loses its point so far as industry i concerned, some sources here be lieve the UAW will turn to Wash ington for help in creating suc industry-wide councils.

Other demands Mr. Reuther is ex pected to make in the months ahea include many things one would ex pect from a labor leader who ap pears to be moving constantly in th direction of socialism: Increase social security, pensions, a guaran teed wage week of 40 hr, roll bac of prices and minimum wages Some sources believe the union ma inject considerable steam behind substitute aluminum for steel as continuation of its antisteel indus try campaign.

Past experience has taught th auto industry that Walter Reuthe aims constantly to move in o management. Without organize opposition on his own executiv board the red-headed Detroit labo leader is now expected to oppos just about as vigorously as befor incentive wage systems, cost-shar ing plans, and speed-up in all it alleged forms.

COMMENCING Nov. 20 al cars in the Chrysler lin will be equipped with Goodyea super-cushion tires. For the pas 3 months Chrysler has been usin the new tires on its 8-cylinde models.

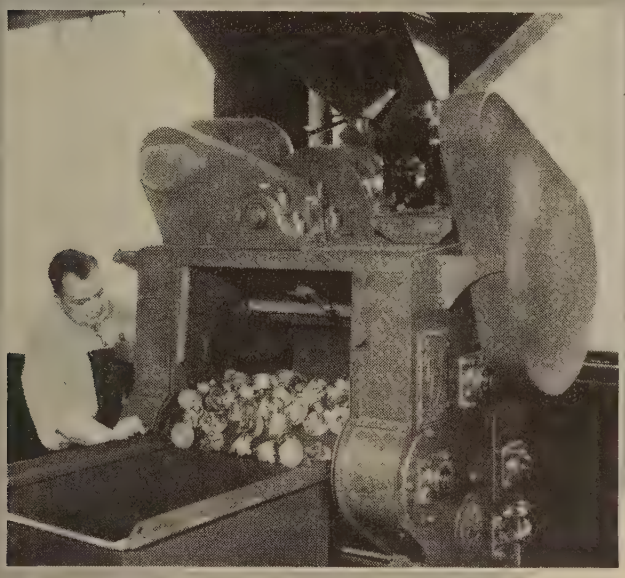
The supercushion tires to b used in Chrysler's sixes are desig nated as 7.60-15, superceding 650 15 tires. Air pressure is 24 lb in stead of 28 lb formerly specified The new tire will have 2410 cu in

The Airless Wheelabrator

CLEANS RECONDITIONED PARTS

"Good As New At Lowest Cost"

As competition becomes more and more intense in the parts reconditioning field, plant-owners engaged in this business are finding TO THEIR PROFIT that the AIRLESS WHEELABRATOR: (1) *Speeds the operation . . .* (2) *Cuts the cost . . .* (3) *Produces better work!*



The importance of time-saving, alone, cannot be under-estimated. A glance at the necessarily partial list of typical parts cleaned will show you the flexibility of the AIRLESS WHEELABRATOR. Its range of application is enormous. Former costly, time-demanding jobs are speedily handled by Wheelabrating. And the parts themselves are restored to their gleaming new appearance — uniformly clean, ready to perform at their finest!

An airless abrasive-blast (requiring no costly compressed air) cuts straight through dirt, rust, and scale in record time. Final inspection of Wheelabrated parts is swift and simple . . . one look, and any part-defects are instantly detected.

Our local representative will be glad to show you a Wheelabrator unit in operation. Find out now just how the AIRLESS WHEELABRATOR gives reconditioners a competitive weapon for success — by cleaning parts GOOD AS NEW AT LOWEST COST.

These Reconditioners Are Profiting From Wheelabrator Performance

Thompson Products, Inc.
Connecting Rods

Newark Steel Drum Co.
Steel Drums

Finnell Systems, Inc.
Floor Waxing Machines

Guild Mfg. Co.
Generators

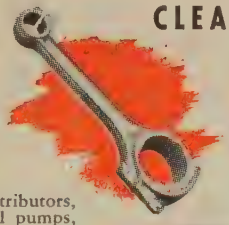
Minneapolis Gas Light Co.
Pipe Fittings

Pipe Line Service Corp.
Pipe Line

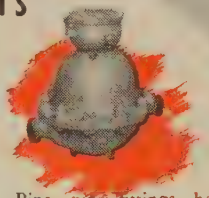
Erie Railroad Co.
Boiler Flues

Chefford-Master Mfg. Co.
Fuel Pumps

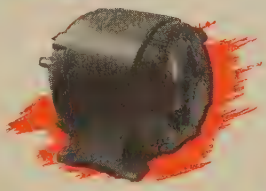
TYPICAL PARTS CLEANED



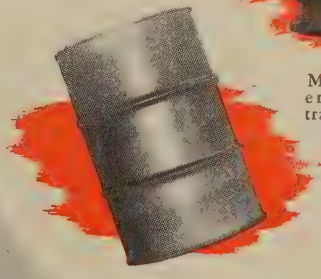
Carburetors, distributors, water pumps, fuel pumps, brake shoes, shock absorbers and other automotive parts.



Pipe, pipe fittings, boiler flues, compressors, oil burners and water meters.

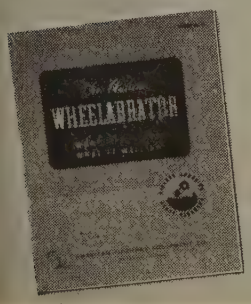


Motors, generators and transformers.



Steel drums and barrels.

Floor scrubbing and waxing machines.



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This informative bulletin gives complete and concise information on all phases of airless blast cleaning. Write for your copy today.

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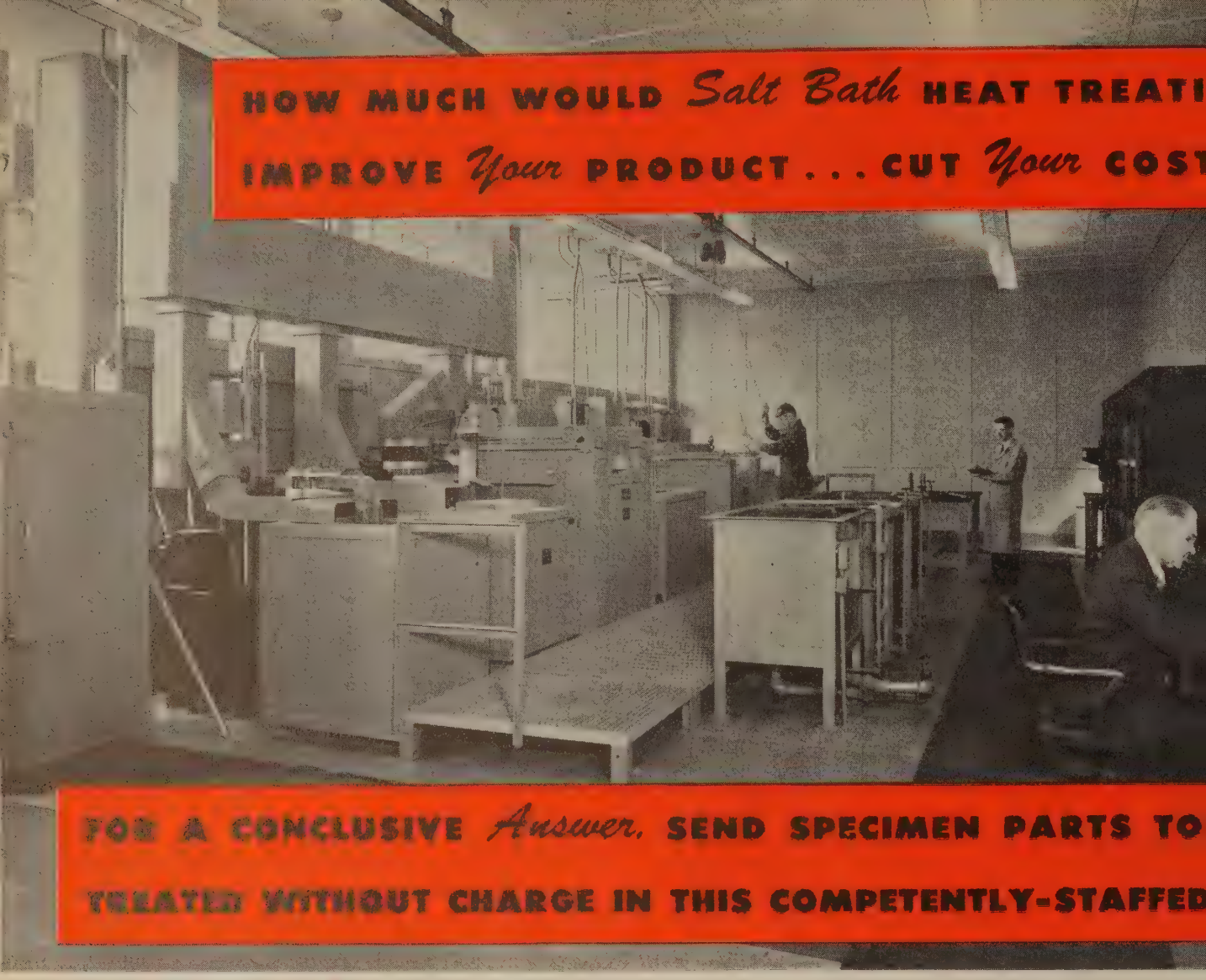
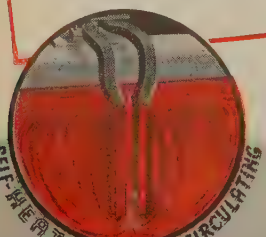


New AJAX METALLURGICAL SERVICE LABORATO

* Some of the processes for which AJAX-HULTGREN Salt Bath Furnaces are widely used:

CARBURIZING
CYANIDE HARDENING
NEUTRAL HARDENING
ANNEALING or HARDENING STAINLESS STEEL
BRAZING
HARDENING HIGH SPEED STEEL
AUSTEMPERING
MARTEMPERING
PROCESS ANNEALING
CYCLIC ANNEALING
SOLUTION HEAT TREATMENT
DRAWING (TEMPERING)
CLEANING, DESCALING, DESANDING



NOT a commercial heat treating plant, the new Ajax Metallurgical Labor nevertheless, is equipped with salt bath furnaces, quench tanks, pickling tank drying oven of *commercial proportions* . . . enabling us to treat virtually any sent us, by any process for which salt baths are adaptable.*

Complete metallographic facilities and hardness testing equipment permit e nation and interpretation of results obtained.

By submitting specimens of your work to be treated and returned for direct parison with similar work treated by your present process, you do not ob yourself or your company — either financially or otherwise.

Quite possibly we can show you the way to improved physical properties a greatly increased rate of production . . . materially reduced heat treating . . . and a very considerable saving in floor space! It costs you nothing to fin

Write on your company letterhead for new 72-page Handbook #116 on Salt Heat Treating Practice.

AJAX ELECTRIC COMPANY, INC.
Frankford Ave. at Delaware Ave., Philadelphia 23, Pa.
The World's Largest Manufacturer of Electric Heat Treating Furnaces Exclusively!
In Canada: Canadian General Electric Co., Ltd., Toronto, Ont.
Associate Companies: Ajax Metal Co ● Ajax Electric Furnace Corp. ● Ajax Engineering Corp. ● Ajax Electrothermic Corp.

AJAX ELECTRIC SALT BATH FURNAC

of air compared with 1920 for the previous models. Treadwidth is 4.91 instead of 4.89. The new tire will be carried on a rim 5.5 in. against the former 4.5.

An entirely different and superior kind of ride, increased passenger-comfort, greater car handling ease and added safety features are claimed for the new tire design. Chrysler is using safety-rim wheels having a rim designed with a bead seat. These rims are said to make it practically impossible for a flat tire to twist, crush down into the center of the rim or pull off. Because tire and rim remain in place, Chrysler engineers contend that it is possible to make safe stops and greatly lessen the chances of ruining the tire.

Kaiser-Frazer appears to be moving closer to its immediate goal of 1500 cars per day. On Nov. 17 K-F added a second shift to its production line in the body-in-white, paint, trim and final assembly divisions. A total of 1200 new employees will be added, according to Kaiser-Frazer officials, bringing the number of workers at Willow Run to approximately 15,000.

According to Kaiser-Frazer officials, the company now has sufficient material commitments to realize the scheduled increase in output. The recent Kaiser-Frazer announcement of a second shift to achieve 1000 car output per day has followed closely an earlier announcement to company dealers that Willow Run is expected to assemble cars at the rate of 1500 per day in early spring. During the month of October, K-F averaged 748 units, bringing the month by month total to 18,701.

ONE of the surprises of the week was the resignation of Lyman W. Slack, as director, vice-president and general sales manager of Packard "after considerable deliberation and with sincere regret," according to George T. Christopher, president of Packard. Mr. Slack joined Packard in 1934 as sales promotion manager. He moved up to sales manager in 1943, was named a vice-president in 1945 and a director in May, 1947. Under his direction, the Packard dealer organization is reported to be the strongest in the company's history.

Mr. Slack was one of the auto industry's real champions of the idea of preparing vigorously for the still-distant buyers' market.

Karl M. Greiner will replace Mr. Slack as sales manager of Packard. Mr. Greiner has been parts and service manager of Packard since September, 1943. He has been constantly engaged in the automobile industry since 1929.

The ability of the auto industry to make model changeovers without mass layoffs of workers is illustrated again at the Ford truck and assembly plant in Highland Park. At the present time Ford truck lines have been suspended for model changeover. It is expected that assemblies will begin again late this month. The public showing of the new models is not expected before January, whereas, dealer showings of the new Ford truck line will be held during December.

Only about 250 employees at Highland Park were affected by the temporary shutdown. Some workers were moved over to the tractor line and some were employed in building up the new production line. At each of the branch plants workers were used to help in stepping up Ford and Mercury passenger car production.

° ° °

ICE-GRIP TREAD: *Tire designer John Antonson shows the rectangular steel coils that are laced into the tread of new B. F. Goodrich aircraft tires to give "biting power" for traction on ice-bound runways. Main features of the coils are their smooth surface, light weight and strength.*

° ° °

175,000 General Motors Employes Enter Contest

Detroit

• • • **Approximately** 175,000 General Motors men and women have entered the competition for 5000 prizes GM is offering for the best letters telling why GM employes like their jobs.

Total entries were more than 58 pct of the 297,000 GM employes in U. S. who were eligible.

Top winners in the contest will be invited to Detroit by GM management where each will receive a new automobile. Included among the cars to be awarded are a Cadillac convertible, three Buicks, six Oldsmobiles, ten Pontiacs and twenty Chevrolets. Other prizes include refrigerators, electric ranges, automatic washers, electric ironers, home freezers and hundreds of other GM-built products.

According to GM officials, the My Job Contest is regarded as the first step in the company's program of adopting a "constructive approach" in employee relations.

Washington . . .

EUGENE J. HARDY

• Maritime Commission pushes investigation . . . Two companies cleared of overweight and overcharge allegations . . . Stream pollution legislation would be costly to industry . . . Tax group report calls for depreciation determination by taxpayer.

WASHINGTON—The Maritime Commission investigation into alleged overcharges and overweight shipments of steel plate during the war years has now been approved by the full commission. It is now a matter of concern to the entire commission, including the legal division, and not confined to the accounts and contracts divisions where it was initiated.

This means that the commission now feels that it is standing on firmer ground and will push the investigation to the limit. In fact, a committee within the agency has been appointed to work on the problem.

As the matter now stands, Maritime claims that it was shipped some 22 million tons of ship plate during the war years whereas it ordered only 20 million tons from the nation's leading steel producers. Since the excess was not ordered and cannot be accounted for, the commission believes that it is entitled to refunds which might amount to as much as $100 million.

Since the investigation was uncovered by THE IRON AGE, Sept. 4, p. 111, several additional developments have taken place. Perhaps the most important of these is the fact that two major steel producers have been cleared by the commission. For obvious reasons, Maritime officials will not identify these companies at this time.

Officials of all the companies being investigated have visited commission offices in Washington and on several occasions Maritime's "Y" building appeared to be housing "a reunion of the WPB Steel Div.," according to Maritime sources.

MARITIME says that it currently has the situation well in hand and that relationships with the steel companies have been "very harmonious."

The crux of the matter, claims Maritime, is the fact that two sets of tolerances were used—a standard set for sheared plate which were definitely adhered to and an assured set for unsheared plate. It is alleged that the excess shipments came from the mills who rolled the unsheared plate and that these mills violated their contracts with Maritime.

The government hopes that when the steel companies are confronted with the facts, which Maritime is sure can be assembled, the refunds can be obtained without resorting to litigation. In fact, Maritime would be willing to make a reasonable settlement to avoid court action.

Inauguration of a federal-state stream pollution control project will cost the nation about $300 million initially, according to estimates of coal producers now preparing for another Capitol Hill battle over legislation proposing curbs on stream pollution.

Coal producers, who would be most heavily hit by such legislation, estimate that the cost of pollution control would add 50¢ to the cost of each ton of coal mined.

They further estimate that the cost of producing a ton of pig iron would rise about 65¢ under such legislation, and that the cost of finished steel would be increased by at least 1 pct.

The coal industry claims it is not in a financial condition to bear 50¢ a ton additional cost, with n additional cost placed on competi tive fuels. Such an increased cos they say, would have to be defraye by increased prices of manufac tured products. But with curren shortages of fuel oil and natura gas, it is unlikely that an increas of 50¢ per ton in the cost of minin coal would reduce the quantity o coal consumed.

BILLS to regulate industry an municipalities alike in thei disposal of waste waters have bee debated almost annually for a dec ade. Although it is unlikely tha such legislation will become la during the 80th Congress becaus of the high cost to the governmen Senator Revercomb, R., W. Va., an Rep. Dondero, R., Mich., chairme of the two Public Works Commit tees, plan to bring up different bill for consideration early in the nex session of congress.

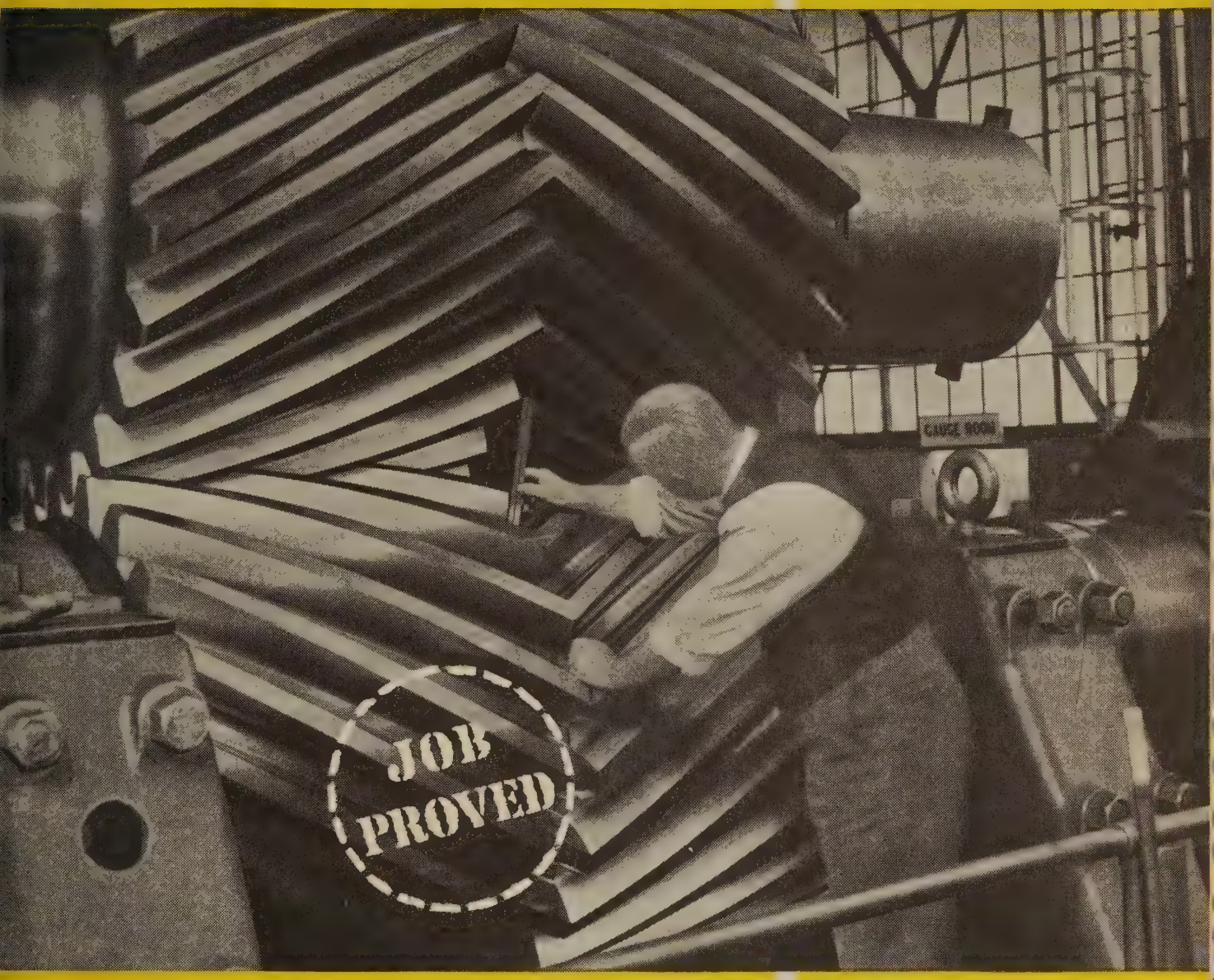
Senator Revercomb is workin for enactment of the Senate-passe bill (S. 418) which provides fo federal loans to states initiatin pollution control projects.

States must give their consen before suits are instigated by th federal government under the Sen ate bill.

The House bill (H. R. 3990) sponsored by Rep. Mundt, R., S. D represents a compromise betwee S. 418 and the original House bil H. R. 123. Rep. Dondero says h will open hearings on H. R. 399 "early next year" but it is mor likely that his committee will firs dispose of hearings on the St. Law rence seaway project.

Meanwhile, a new development i treatment of city sewage pollute by industrial wastes has been re ported by the Office of Technica Services of the Commerce Dept. Dr George Ornsen, a New York Cit consulting sanitary engineer, de scribes a German innovation i "The Niers Sewage Disposal Proc ess" (PB 78208). The Niers proc ess included removal of the iro content in sludge in order to spee sludge digestion. About 60 pct o

Production Up 22% on 44-Inch Pinion Gears



SUNICUT . . .

Enables Gear Manufacturer to Increase Feed, Speed, and Tool Life; and to Improve Finish

Since changing to Sunicut, a manufacturer of steel-mill gears has increased production by 22%, improved finish, and added greatly to the life of his gear cutters.

Operation: Cutting 44" herringbone gears.
Machine: Dominion herringbone gear generator.
Materials: Stainless steel, high carbon steel, bronze, other alloys.
Cutting Oil: Sunicut.

This case is just one of thousands in which experienced production men have found that Sun "Job Proved" cutting oils help to increase production and to improve quality as well.

Sunicut is a clear, free-flowing cutting oil, produced by an exclusive Sun process. It has high lubricating value and has excellent heat-dissipating and anti-weld properties. It makes possible heavy cuts at high speed while accuracy and satin-smooth finish are maintained. For full information call your Sun Cutting Oil Engineer or write Department 1A11.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.—Toronto and Montreal

SUN
SUNOCO
INDUSTRIAL PRODUCTS

the iron in the sludge was recovered and returned to the process after being used as a coagulant.

SCHEDULED for release within the next 45 days is a Treasury Dept. study which will examine present depreciation practices. It will consider the economic, equity, administrative, and revenue consequences of alternative proposals for flexible depreciation allowances and for accelerated depreciation.

Despite the forthcoming Treasury report, it appears that the Ways and Means Committee will go its own way in re-writing tax legislation, including the sections pertaining to depreciation allowances.

Principal features of a new tax bill will be taken directly from the report of Roswell Magill's Special Tax Study Committee, an advisory group serving the Ways and Means Committee. Ways and Means Chairman Knutson, R., Minn., has given notice that any new tax bill will include a number of the Magill recommendations.

For this reason, the Magill report's views on depreciation take on increasing importance. The report realizes that internal revenue agents customarily contend that the taxpayer has fixed too short a life for the assets of his plant. "They are reluctant to give much weight to obsolescence or to increased wear and tear due to extra shift operations," it states.

"Taxpayers and their auditors ought to be better judges of depreciation rates and methods than internal revenue agents, because they are much more familiar with actual operating conditions in their plants."

IT is pointed out that "in any event the taxpayer will only recover the cost of the asset; and if he takes too much or too little depreciation this year, the overage or deficiency will necessarily be adjusted in future years."

Accordingly, the committee recommends:

(1)—That, for taxable years commencing on or after Jan. 1, 1948, in the cases of assets with a life of more than five years, a deduction shall be allowed for the depreciation claimed by the taxpayer on his return, in accordance with the method of computing depreciation and the rate used in his books of account. The taxpayer once having determined a rate and method of depreciation for an asset will be required to continue its use, unless permission to change is granted by the Bureau of Internal Revenue.

(2)—That depletion and depreciation in excess of the amount properly allowable should not be required to be deducted from the basis of property unless a tax benefit resulted from the excessive deduction.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

15,000 Freight Cars Monthly Being Asked; More Steel Promised

Washington

• • • **Claiming that the** White House considers the shortage of freight cars the No. 1 domestic problem, Office of Defense Transportation Director J. Monroe Johnson last week stated that he had been directed to immediately consider the possibility of raising the monthly freight car output to 15,000 cars.

As a result of a meeting on Nov. 19 with the American Iron and Steel Institute, Johnson stated that the steel industry had agreed to increasing deliveries, particularly of such items as sheet and plate, in order to reach the present 10,000 car monthly goal as soon as possible.

AISI is also reported to have agreed to increasing the delivery of steel for the car-repair program. These new commitments would increase overall steel tonnage for the freight car program by 22 pct, while steel for repair purposes would be up about 43 pct. The ODT director stated that the increased deliveries would be made in time for January 1948 production.

The 15,000 car program, purportedly backed by the White House, is in line with the Harriman Committee recommendations which held that monthly production of 14,000 cars is an absolute "minimum."

As a result of the increased steel delivery commitments, Johnson has stated that by January of next year 14,000 cars will be added to the nation's supply on a continuing monthly basis, 10,000 from the production lines and 4000 as a direct result of the increased repair program.

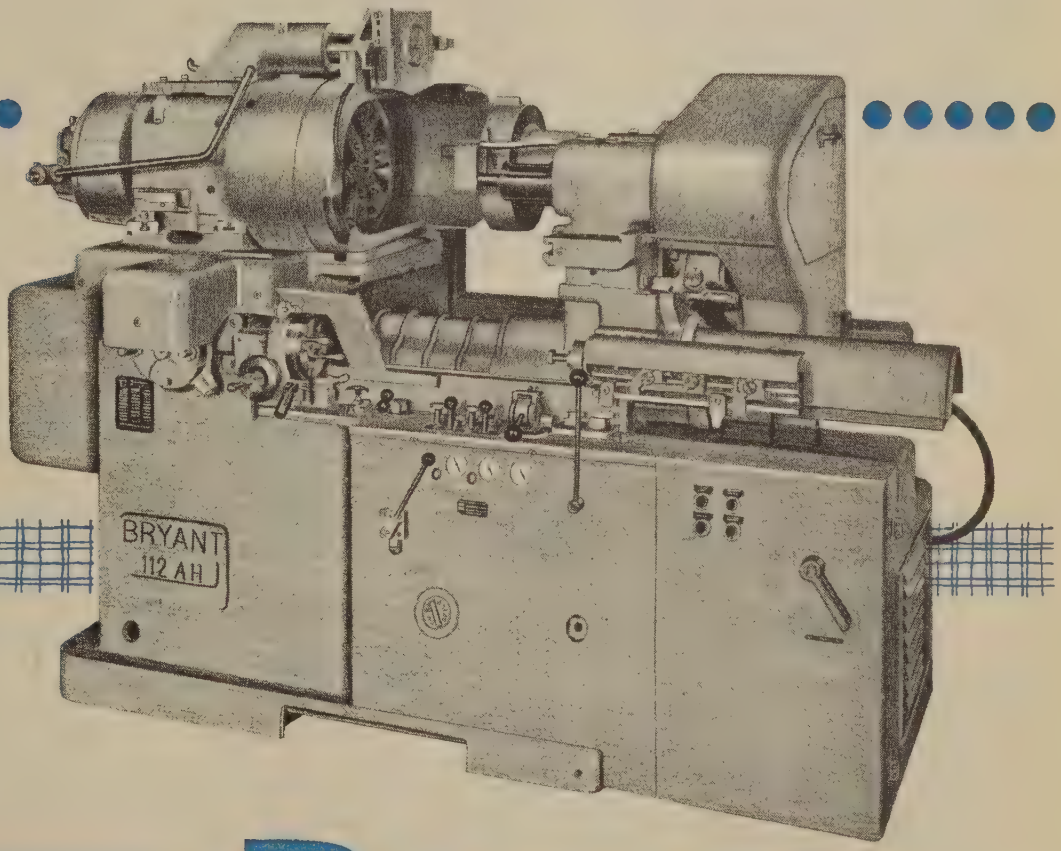
Vermont grows Chameleons, too

The Bryant 112AH Hole and Face Grinder is a real chameleon when it comes to changeover. First, the 112AH is equipped with an American Standard Spindle Nose, so that holding fixtures, chucks or face plates can be changed in less than 2 minutes. Second, selection of cycle phases for either manual or automatic operation is accomplished simply and rapidly through main wheelslide control. Wheelslide traverse for wheel dressing and grinding may be set independently through two convenient hand throttles. Positive-locking reversing dogs set grinding stroke quickly. Third, a rapid traverse cross-feed speeds set-up and a precision feed dial provides accurate size control. Two wheelheads allow grinding the face and bore at one chucking.

In addition to the chameleon qualities the 112AH has features that make it a prolific producer. Wheelheads may be powered by belt for finishing large diameter holes or by the Bryant Hi-Frequency Wheelhead with speeds up to 100,000 r.p.m. for most efficient grinding of small bores. The No. 112AH has infinitely variable spindle speeds from 100 r.p.m. to 2000 r.p.m. Universal stop rod positions speed face grinding. And, of course, the 112AH has all the basic Bryant design and construction highlights, thus making it a producer of finer work finishes within the closest tolerances at speeds you never believed attainable. For complete information on this Vermont chameleon, ask for the Series 112AH Catalog Sheet.

112-AH

HOLE & FACE GRINDER



Send for the Man from

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

BRYANT

West Coast . . .

ROBERT T. REINHARDT

• Dr. Mathesius reports on Geneva Steel Co. operations and plans . . . Reserve of long-range robot missles suggested as peace insurance . . . Closed cylinders in scrap prove hazard in Northwest furnaces.

SALT LAKE CITY—The third set of bids on the government-owned Kalunite plant in Salt Lake City brought a new firm into the field with the top offer. American Potash & Chemical Corp. bid $752,000, approximately $100,000 above War Assets Administration's appraised value, and agreed to spend an additional $750,000 to convert the facility to the production of treble super phosphate fertilizer.

The company presumably intends to blend its Searles Lake, Calif., potash and borax with intermountain phosphate.

J. R. Simplot of Idaho, heretofore the high bidder, dropped to third place with an offer of $625,000. The second bid of $635,000 was submitted by Columbia Metal Co., which attached a condition that WAA also sell it the aluminum plant at Salem, Ore. Columbia offered $510,000 for the Salem plant, which it has been operating under lease from the government.

The Salt Lake City plant was built for the experimental production of alumina from southern Utah alunite.

Dr. Walther Mathesius, president of Geneva Steel Co., reported on U. S. Steel Corp.'s stewardship of the Utah steel plant, and indirectly replied to complaints that the steel industry is stifling expansion, in a speech to the Salt Lake City Rotary Club last week. He made a convincing case that the Corporation is not holding back in the west at least. But an unanswered question in the minds of his audience both before and after the report was whether the industry critics are more interested (so far as the Corporation is concerned) in increased capacity or a monopoly case.

Summarizing direct U. S. Steel expansions in the West since it purchased the Geneva plant for $47.5 million, Dr. Mathesius listed more than $70 million for tinplate and cold rolling facilities at Pittsburg, Calif., and Los Angeles; $16 million for additions and improvements in Utah and the $18.6 million which the corporation is committed to spend for providing facilities for producing hot-rolled coils at Geneva. Machinery and equipment for this latter project has started to arrive here but Dr. Mathesius said he was unable to say when the overall program would be completed.

IN addition to Corporation expansions, he listed these 16 new steel consuming enterprises which are being planned or are under construction in California, Utah and Oregon: America Radiator & Standard Sanitary Corp., Richmond, Calif., plumbing; American Radiator & Standard Sanitary Corp., Torrance, Calif., plumbing; Apex Steel Co., Los Angeles, structural fabrication; Butane Tank Corp., Los Angeles, plate fabrication; California Steel Products Co., Richmond, Calif., sheet fabrication; Chicago Bridge & Iron Co., Salt Lake City, plate fabrication; Chrysler Corp., San Leandro, Calif., trucks; Continental Can Co., Portland, Oreg., containers; Crown Cork & Seal Co., San Francisco, containers; Food Machinery Corp., San Jose, Calif., machinery; General Electric Co., San Jose, Calif., appliances; General Motors Corp., San Leandro, Calif., vehicles; Oakland Foundry Co., Campbell, Calif., stoves: Pittsburgh-Des Moines Steel Co., Sunnyvale, Calif., structural fabrication; Westinghouse Elec. & Mfg. Co., Sunnyvale, Calif., appliances; Wire Mold Co., Los Angeles, tubing.

Without attempting to enumerate, he called attention to expansions of steel consuming plant that were already established in the Far West when the Corporation acquired Geneva.

Shipments of products from the Geneva plant during its first 1 months of operation by the U. S Steel subsidiary were, in net tons pig iron, 192,292; plates, 556,558 structural shapes 87,867; billet and slabs, 66,518; coal chemical 49,604; and coke products, 71,674 for an aggregate of approximately 903,000.

During that period the company had to build up and train its personnel from a skelton standby staff and has been handicapped by coal production some 25 pct under the desired supply. Chief factors holding down coal supply have been the car shortage and lack of housing facilities for miners. The housing situation will shortly be improved by completion of 120 new homes at Dragerton, the company's coal mining town.

LOS ANGELES—Strong fleet of long-range robot bombs which could be launched at an enemy almost instantly in case of an attack on the United States could be a powerful force for peace according to John K. Northrop, president, Northrop Aircraft, Inc.

Defense warehouses, providing storage for large numbers of powerful, long-range guided missiles, are envisioned as a development of the future by Mr. Northrop.

"Sure knowledge of powerful and instantaneous reprisals in spite of anything that could be done should give pause to those contemplating aggressive maneuvers," he declared. "Once produced, missiles could be stored in widely scattered and well-camouflaged outposts, either above or below ground, at a fraction of the expense and manpower required to maintain a conventional airforce of equal striking power in readiness."

Mr. Northrop pointed out that at best, development of such long-range, pilotless weapons will be a tedious, lengthy process. According to him it would take 4½ years to develop subsonic pilotless airplanes to the production stage and the supersonic rocket is probably 10 years away. It would require

COACH JIMMY CONZELMAN AND ALL-AMERICAN CHARLEY TRIPPI, COURTESY CHICAGO CARDINALS

Master of Power Application

Third down and goal to go. Twenty seconds to turn defeat into victory, to rush across a touchdown. Instantly, undisturbed by 60,000 hoarsely yelling fans, the coach names the play . . . the quarterback to call it . . . the freshest plunger to execute it . . . the most vulnerable spot to strike.

This big-time coach stakes his reputation on crises such as this a hundred times a season. He has survived years of white-hot competition, growing grey and wise. He is a master of selecting the proper method, time and place for applying football power.

Twin Disc Clutch Company engineers also are masters of power applications. They are as familiar with power transmission and its problems as the football coach is with his players and the formations of his opponents. Their 29 years of experience in designing, manufacturing and applying the right equipment and methods . . . clutches, hydraulic drives, or marine gears . . . is your assurance their recommendations will produce efficient, economical results.

Obtain the assistance of Twin Disc application engineers. Outline your problems in a letter to the TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois.)

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

least 10 years for the development of supersonic pilotless airplanes before production could begin, according to Mr. Northrop.

Although it is reported that North American Aviation, Inc., is expected to merely retain its present level of 17,000 employees, this company has leased five units of the government-owned Douglas Aircraft Co., Inc. manufacturing plant at Long Beach from the WAA.

Under the terms of the lease, the company will pay $226,580.29 as monthly rental and will pay all taxes, insurance, maintenance and utilities costs for the period of the 5 year lease. Approximately 26 acres of land, five principal buildings and several temporary structures providing about 422,000 sq ft of floor space are involved.

The company is now producing planes for the Army Air Forces and has been occupying a portion of this property under an interim arrangement.

Current employment at Long Beach is approximately 2200. This expansion of activities may increase that payroll to 4000 by next January. D. R. Zook, employment director, had previously indicated that overall employment of 17,000 would be maintained and that further hiring in the shop departments would be almost entirely of a replacement nature. Engineering and aerophysics departments are, however, not included in his report and employment stabilization plan.

SPOKANE—Hope that the ferrosilicon plant, which was operated at Mead during the war by the Electro-Metallurgical Co. in connection with the magnesium plant there, will again produce, has once more been stirred up by the recent inspection of facilities by officers of the Chromium Mining & Smelting Co. of Ontario, Canada and Buffalo.

L. H. Timmins investigated the facilities of the Mead plant with WAA officials including D. M. Baird, former WAA real property div. head in Spokane, Elmo Buttle chief of the industrial div. of the San Francisco zone; and W. T. McGinnis, chief of the industrial div. of the San Francisco office.

Chromium Mining operates ferrosilicon and ferrochrome plants in Canada and the United States and it is believed the interest of the company in the Mead plant is centered only on the ferrosilicon furnaces and not on the magneisum plant itself.

This production unit is held by the WAA under the National Security Clause as is the magnesium plant itself. It therefore is attractive only to some company which can use the facilities as they now stand, or with slight modifications, as they must be returnable to the government in the condition in which they were first accepted within 30 days' notice.

Announcement that the Kaiser Co. was the high bidder for a German aluminum foil mill has given rise to the hope that this facility will be installed here if the Kaiser bid is accepted.

It is understood that in all probability the foil mill will become a part of the Trentwood rolling mills of The Permanente Metals Corp. However, the federal government has not as yet made an announcement concerning the acceptability of the Kaiser bid.

October production at the Trentwood aluminum rolling mills is reported as being the largest since this corporation took over the plant 16 months ago. Operations are limited only by the availability of pig aluminum and as soon as the recently opened Tacoma reduction plant is in full operation and furnishing approximately 1700 tons of pig aluminum per month, production will be still further increased, according to John R. Meek, works manager.

The Permanente Metals Corp. has announced the appointment of 23 distributors throughout the country, many of whom are steel warehouses. Kaiser aluminum distributor sales will be under the direction of Robert G. Welch, longtime employee of the Kaiser organization.

SEATTLE—What is claimed to be the first "box-body" bus is now being produced by Kenworth Motor Truck Corp. for delivery to the Suburban Transportation Co. of this city.

Fifteen of these Model K-10 buses are on order with Kenworth.

According to H. E. Simi, manager of the Kenworth Bus Div., a complete box body for buses has never before been developed. The closest approach to such construction has heretofore involved wooden flooring. The K-10 uses aluminum formed into tressed panels. Insula tion is inserted in the tressed shape thus giving the flooring bette acoustic values as well as insula tion, according to Mr. Simi. Obv ously, there is a gain in weigh saving and strength. An added ad vantage is the moisture-proof cha acteristics of the aluminum flooring

Aluminum is also used both in side and outside of the body whic is built on a high tensile stee frame.

The standard K-10 is a 33-pas senger bus but it can have on panel added and thus carry 37 pas sengers. Those units designed fo city transit use can have a cente door which reduces seating capa ity to 31 or 35, depending upon in dividual design.

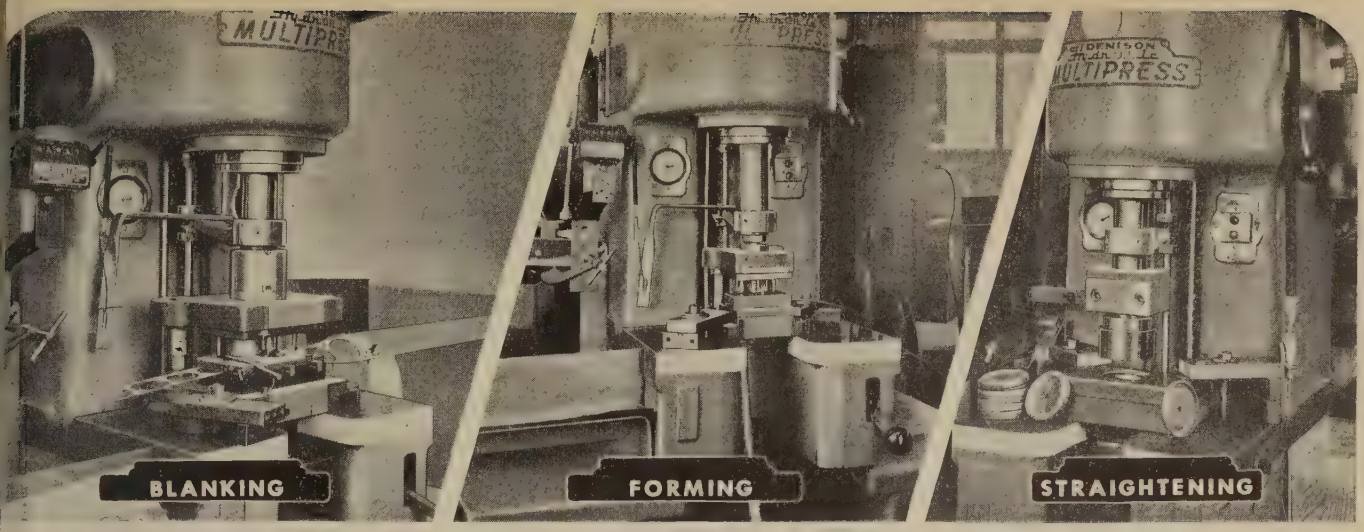
Kenworth is following the polic of making most of its design standard as far as body characteris tics go. The company is, howeve offering a choice of two types o fronts and rears to the buses i addition to the increased seatin arrangement and center door a alternates.

This company is also now pro ducing an electric trackless trolle and has 50 of these on order fo the Portland Transit Co. In ge eral the trackless trolleys follo the same lines as the buses.

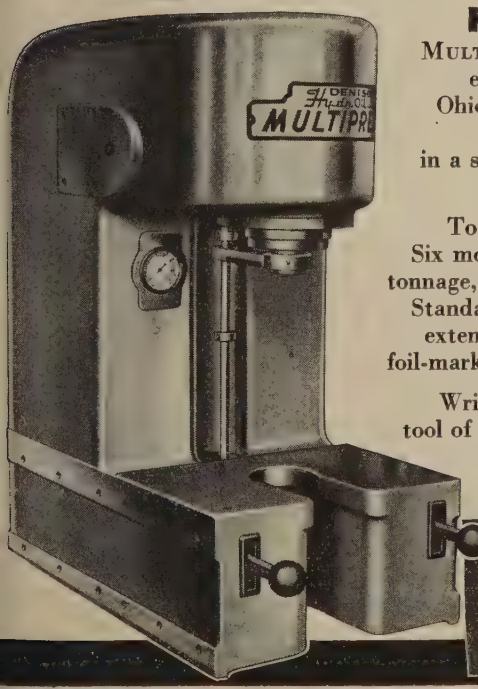
STEEL producers in this are are are being beset by a safet hazard in the form of closed cyli ders in scrap which have cause several explosions in furnaces du ing the last several months.

Isaacson Iron Works has had a least two such explosions in whic fortunately no one was injure However, there was considerab property damage. In one instan a worker had just walked awa from the furnace when the e plosion ripped the bricks out of th top and necessitated a 3-day shu down. On the second occasion, th explosion necessitated a 10-hr shu down.

To prevent further accidents o this kind, the company has st tioned a man to go through all i coming scrap and look for cylinde and the hunting thus far has bee good with at least one a day sho ing up. This inspection operatio is costing the company approx mately $1000 per month. The prin catch recently was a cylinder co taining, according to the label, 8 pct glycerine and 20 pct water.



t's all in a day's work for MULTIPRESS



Here's proof, right from the production line, of the quick ease with which MULTIPRESS can be retooled for one high-speed job after another. With these six efficient tooling set-ups, The Buckeye Stamping Company, of Columbus, Ohio, adapts their MULTIPRESS units to changing production needs with minimum loss of operating time. All six operations could be handled on one MULTIPRESS in a single day! Using a special die adapter on the Multipress ram, die change time can be reduced to as little as five minutes.

To this simplified tooling, MULTIPRESS adds unusual operating flexibility. Six models, in 4, 6 and 8-ton capacities, offer a choice of manual and automatic tonnage, speed and cycling controls for almost any type of "pressure" job. Standard MULTIPRESS accessories include benches, side shelves, work-table extensions, a variety of bolster plates, and accessory tooling for indexing, pelleting, foil-marking and many other special operations.

Write for full details on this cost-cutting, production-boosting, bench-size tool of amazingly compact and efficient design.

THE DENISON ENGINEERING CO., 1158 DUBLIN RD., COLUMBUS 16, OHIO

DENISON EQUIPMENT for APPLIED HydrOILics

HydrOILics INDUSTRY'S RIGHT HAND

PERSONALS

o o o

• **Max M. Kipfer** has been elected president of Aluminum Seal Co., a wholly-owned subsidiary of Aluminum Co. of America. Mr. Kipfer will make his headquarters at Richmond, Ind. He succeeds the late **John E. Sharp.** Mr. Kipfer joined the seal company in 1924 and was made plant superintendent at its headquarters in New Kensington, Pa., in 1930. He was promoted to vice-president and works manager in 1944, and to general manager in May 1947.

• **Harry I. Lutz** has been elected secretary of the Edgcomb Steel Co., Philadelphia. Mr. Lutz has previously been a member of the board of directors, and has been associated with the Edgcomb organization for the past 23 years.

• **H. B. Chambers** has been appointed chief service metallurgist and **T. H. Adair,** chief plant metallurgist, of Atlas Steels Ltd., Welland, Canada. Prior to joining Atlas Steels in 1931, Mr. Chambers was associated with the Pittsburgh Crucible Steel Co. and Timken Roller Bearing Co. Mr. Adair has been with Atlas Steels in the metallurgical division since 1934.

• **Victor R. Williams** has been named superintendent of rolling mills at Oregon Steel Mills, Portland, Ore. Mr. Williams was formerly with Columbia Steel Co. at Pittsburg, Calif.

• **C. S. Conrad** has been appointed general manager of sales for Columbia Steel Co., San Francisco. Other recent Columbia personnel appointments are **W. B. Sawyer, Jr.,** assistant general manager of sales-administration; **Eric Barnett,** assistant general manager of sales-distribution; **C. L. Hamman,** general sales staff manager; **Ralph Winship,** manager of sales for the Washington division; **Andrew Carrigan,** manager of sales for the central division, San Francisco, and **B. W. Mitchell,** manager of sales for the Oregon division. **E. W. Long,** claims bureau chief for Columbia, has retired recently after serving 39 years with subsidiaries of U. S. Steel Corp.

• **R. H. Bell** has been promoted to the position of superintendent of the bolt and nut department of Bethlehem Pacific Coast Steel Corp. South San Francisco plant.

• **Charles A. Dilley** has been promoted by Cleveland Graphite Bronze Co., Cleveland, from assistant personnel director to the newly-created position of assistant to the executive vice-president. He has been with the company since 1941. **Fairchild L. Heltman,** company recreation director, has taken over Mr. Dilley's duties in the personnel division.

R. D. MOSSMAN, manager of advertising, Jones & Laughlin Steel Corp.

• **R. D. Mossman** has been named manager of advertising of Jones & Laughlin Steel Corp., Pittsburgh. Mr. Mossman spent 10 years in the advertising agency business in Philadelphia before joining the advertising department of Jones & Laughlin in 1944.

• **Nils A. Lennartson** has been made assistant director of public relations for the New England district of U. S. Steel Corp., New York. He was recently in the public relations department of the Maine Central R.R.

• **Lee H. Benson** has joined the Tuthill Pump Co., Chicago, as vice-president in charge of manufacturing. Mr. Benson comes to Tuthill with a background of experience over the past 40 years with such organizations as General Motors, Westinghouse and Willys-Overland.

• **Peter Groustra,** formerly district sales engineer at Detroit fo Link-Belt Co., has been appointe district sales manager in charg of a new sales office in Gran Rapids, Mich. He will be assiste by **Herbert E. Wolf,** who has bee a member of the staff of the Link Belt Ewart plant in Indianapoli since 1934.

• **Brock Bradley, H. C. Mathey Franklin B. Hunt,** and **Ernest I Miller** have been elected assistan vice-presidents of the Liquid Ca bonic Corp. Mr. Bradley, forme ly vice-president of the subsidiary Liquid Carbonic Canadian Corp Ltd., Montreal, will move to th main office in Chicago. He joine Liquid 20 years ago. Mr. Mathey as recently appointed genera manager of the corporation's Pa cific operations, will continue t direct the company's West Coas activities from the branch at Lo Angeles. He joined the compan in 1926. Mr. Hunt and M Miller will remain in Chicago a assistant vice-presidents at th main offices of the corporatio **Byron W. Goulding** has been ap pointed sales manager of the com pressed gas division, **M. D. Rebe** soda fountain sales manager, **Ber nard J. Oos,** assistant advertisin manager, and **W. P. Mudgett,** sod fountain and ice cream cabine sales promotion manager.

• **W. T. C. Carpenter** has resigne as first vice-president of the U. S Pipe and Foundry Co., East Bur ington, N. J. Mr. Carpenter, wh has been a member of the com pany's board of directors sinc 1902, a member of the executiv committee since 1912 and firs vice-president since 1920, will con tinue in the two former posts. **F. S Gordon** has been elected to suc ceed Mr. Carpenter as first vice president. **Gen. Donald Armstron** has been elected a director, member of the executive commi tee, and executive vice-presider of the company.

• **Sidney J. Sobourin** has been ap pointed resident manager of th Fisher Body plant of Genera Motors Corp. at Hamilton, Ohi Mr. Sobourin succeeds **F. R. Hoo** who has been manager since con struction began. Mr. Hook is no being transferred to the new plan at Euclid, Ohio.

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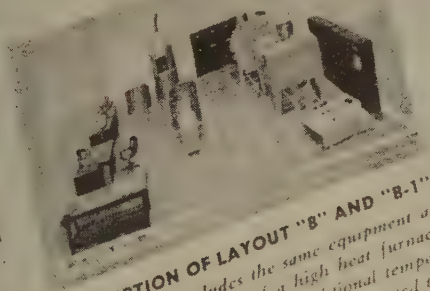


DESCRIPTION OF LAYOUT "B" AND "B-1"

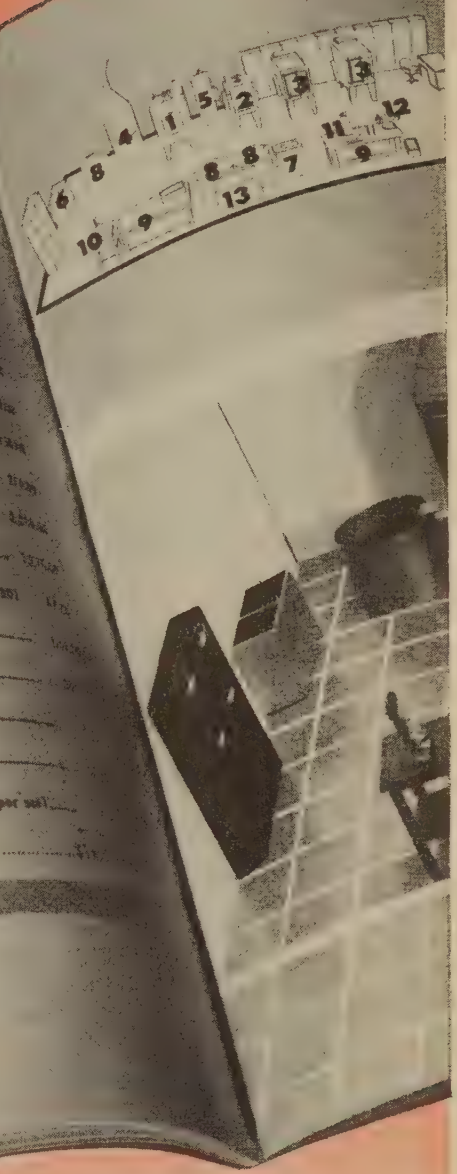
Layout "B" includes the same equipment as "A" with the addition of a high heat furnace for high speed steel and an additional tempering furnace. As in all the layouts presented the location of instrument and electrical panels is dictated by individual requirements. Recording pyrometers are utilized on tempering furnaces so that a time record can be kept. This is desirable for all types of steel—but particularly so when high speed parts are being handled.

Two tempering furnaces are recommended in this layout because lack of tempering capacity is a common handicap in too many shops. What with the double and triple tempering of high speed parts, one tempering furnace can easily be tied up full time at 1050°F.—so a second tempering furnace should be allowed for to handle the carbon and oil hardening parts as well as such production tempering as may come along.

Space requirements of layout "B" are 42' x 20'. An alternate arrangement is layout "B-1" with dimensions 32' x 26'. Only one tempering furnace is provided, otherwise equipment requirements of the two layouts are identical.

IDENTIFICATION AND PRICES OF EQUIPMENT — LAYOUT "B" AND "B-1"

NUMBER		APPROXIMATE PRICE
1	15" x 30" x 12" Hardening Furnace, 2000°F. max.	
2	10" x 18" x 8" High Speed Furnace	
3	15" x 24" x 18" Toolroom Tempering Furnace, (2 @ $2,150.00 each)	
4	12" x 18" Pot Furnace	
5	Atmosphere Generator	
6	Hot Soda Wash and Rinse Tank	
7	Salt Quench (Hot)	
8	Quench Tanks (3 @ $428.00)	
9	Work Benches (@ $30.00 and $37.50)	
10	Hardness Tester	
11	Straightening Press	
12	Bench Grinder	
13	Oil Cooler	
	3 Sets Tongs (@ $35.00 per set)	
	TOTAL	



YOUR COPY AVAILABLE ON REQUEST . . . .

LINDBERG ENGINEERING COMPANY
2452 WEST HUBBARD STREET
CHICAGO 12, ILLINOIS

This booklet tells how to select furnaces of the proper size,—shows recommended layouts,—gives approximate floor space requirements, —shows prices of auxiliary equipment,— tells how much a complete toolroom will cost.

LINDBERG FURNACES

• **Victor Brown,** director of research and metallurgy of the Kropp Forge Co., Chicago, has been elected a director of the company.

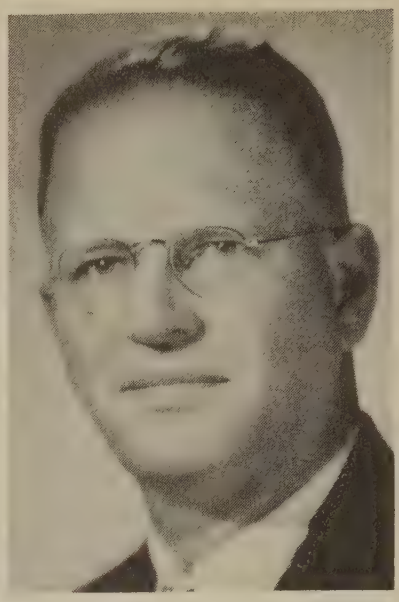
• **Marshall T. Litton, William J. McGhee** and **James H. Simms** have been appointed to the engineering department of Vulcan Copper & Supply Co., Cincinnati.

•**Robert Swayze,** formerly of the factory sales office, has been appointed division manager in Texas with headquarters in Dallas for the Aro Equipment Corp., Bryan, Ohio. **Herbert Freeman** and **Merle Millor, Jr.,** have joined the factory sales force. **E. E. Allen** has been appointed assistant to C. P. Enston in the Cleveland territory. **H. H. Higgins** has been appointed division manager in the Montreal territory, and **Vernon C. Leif** has been appointed to the Los Angeles office under L. W. Lisle.

• **George W. Frick** has been named special representative in sales development by Latrobe Electric Steel Co., Latrobe, Pa. Mr. Frick for many years was affiliated with the Firth Sterling Steel & Carbide Corp., rising to the position of general sales manager with that firm. More recently he founded the Carbide Die & Mold Co.

• **Earl R. Nelson** has been appointed manager of the Cincinnati plant of Joseph T. Ryerson & Son, Inc., succeeding **Wayne D. Dukette.** Mr. Dukette will head the company's new steel-service plant in the San Francisco area, now under construction. Mr. Nelson began his career with Ryerson in 1928. For the past 10 years he has served as sales representative in the Dayton-Springfield, Ohio area.

• **Anthony J. Zino, Jr.** has been appointed assistant sales manager of the industrial sales division, Swan-Finch Oil Corp., with headquarters in the home office, New York. Prior to his present connection he was for 8 years sales engineer and New York sales manager of Lubri-Zol Corp., and for the last 5 years, eastern manager of the lubrication department of E. F. Houghton & Co.



C. A. WIEPKING, chief engineer, Delta Mfg. Div., Rockwell Mfg. Co.

• **C. A. Wiepking** has been appointed chief engineer of the Delta Mfg. Div., Rockwell Mfg. Co., Milwaukee. Previous to his appointment, Mr. Wiepking had been Delta's research engineer.

• **Frederick C. Shotwell,** formerly with the Republic Steel Corp., has joined the Cold Metal Products Co.'s Detroit sales force. **Samuel M. Marshall** has been transferred to the New England sales division with headquarters in Hartford, Conn.

• **D. A. Hutchison** has been promoted to assistant sales manager of Sterling Tool Products Co., Chicago. Mr. Hutchison was formerly district sales manager for the Illinois, Wisconsin, Indiana territory. **V. H. Drummond,** formerly district manager in the Missouri, Kansas, Nebraska territory, has been appointed district manager of the central territory formerly managed by Mr. Hutchison. **Jerry J. Howe,** who formerly handled sales under Mr. Hutchison to jobbers in the Chicago metropolitan area, has been transferred to St. Louis as district manager in the territory previously handled by Mr. Drummond. **Neil S. Rowe** has taken over the Chicago territory sales which Mr. Howe relinquished, and **J. M. Warnimont,** who formerly held the title of assistant sales and advertising manager, has been named advertising manager of the company.

• **J. G. Brady** and **John Taylor,** both veterans in the Nash Motors Div. of Nash-Kelvinator Corp., have been advanced to the positions of assistant purchasing agents at Kenosha, Wis.

• **Earl Blaine,** formerly chief inspector, has been appointed assistant works manager, and **John Darrah,** formerly assistant to Mr. Blaine, has been appointed chief inspector of the Budd Co., Philadelphia.

• **Howard J. Scaife** has been made manager of market development, and **William F. Ogden,** manager of product planning, for Hotpoint, Inc., Chicago. Mr. Ogden came to Hotpoint in 1936 from the Georgia Power Co., and since that time has served as commercial engineer, and more recently as assistant chief engineer. Mr. Scaife was associated with the General Electric Co. in various capacities from 1932 until 1936, when he was transferred to Hotpoint as assistant sales manager of refrigeration. In 1944 he was named western regional sales manager.

• **Dr. A. E. Alexander,** director of the Gem Trade Laboratory, Inc., New York, has become associated with Horizons Inc., Princeton, N. J.

• **James P. Haight,** works manager of the fabricating plants of the Aluminum Co. of America, Pittsburgh, has been named assistant general manager of the fabricating division. **T. I. Stephenson, Jr.,** has been advanced to the post of assistant manager of Tennessee operations and **W. W. Wright** has been made new manager of the Alcoa works fabricating plants.

• **T. R. Snedden** has been appointed maintenance engineer of Copperweld Steel Co., Glassport, Pa. Mr. Snedden had formerly been with National Tube Co. and Matthews Conveyor Co.

• **B. A. Best** has been named secretary-treasurer of Dearborn Motors Corp., Detroit. Mr. Best was previously associated with Frieze Instrument Div. of Bendix Aviation Corp. and Haskins & Sells.

• **T. Norman Willcox** has been named manager of the methods and equipment laboratory of the plastics division of the General Electric Co.'s chemical department, Pittsfield, Mass. Mr. Willcox, who has been section engineer of the methods and equipment laboratory since last February, came to the company in 1936.

• **Charles E. McGlaughlin** has joined the headquarters staff of the Bituminous Coal Research, Inc., Pittsburgh, as special representative. He succeeds **T. A. Day** who became a member of the public relations staff of Bituminous Coal Institute, an affiliated organization. Mr. McGlaughlin was executive secretary of Pittsburgh's North Side Chamber of Commerce prior to his joining Bituminous Coal Research, Inc.

• **A. S. Terry** has been appointed sales manager of the Bellows Co., Akron, Ohio. He was formerly head of the Detroit district office for Bellows.

• **M. E. Comstock** has been appointed manager of the electrical division branch office in Boston of the Wagner Electric Corp. Mr. Comstock has been with the company since 1919. Prior to his appointment he held the position of sales engineer for 28 years. **H. M. Furtney,** who recently joined the Wagner organization, has been placed in charge of the Tulsa suboffice, which has been transferred from the Houston branch office territory to the Kansas City branch office territory. **A. W. Maas,** formerly at Tulsa, has been transferred to the Philadelphia branch office. **Harry Anderson** has joined the sales force of the company's Minneapolis branch office.

FOREST J. SMITH, supervisor of labor relations, Carnegie-Illinois Steel Corp.

• **Forest J. Smith** has been appointed supervisor of labor relations, Carnegie-Illinois Steel Corp., with headquarters in Pittsburgh. He succeeds **A. H. Wardwell,** who will become director of raw materials for American Steel & Wire Co. Both companies are U. S. Steel Corp. subsidiaries. Mr. Smith, who has been superintendent of industrial relations at Carnegie-Illinois' Gary steel works, began his association with the company there 32 years ago as a recorder. He held various positions in the chemical laboratory organization before becoming assistant superintendent of industrial relations 11 years ago. He became industrial relations superintendent in 1939 and continued in this position until his current promotion.

• **K. W. Jonvik** of Oslo, Norway, has been appointed a representative of Kennametal Inc., Latrobe, Pa.

• **W. G. Miller** has been named assistant to the works manager of Westinghouse Electric Corp., Buffalo. He had been manager of the headquarters manufacturing staff in Pittsburgh since January 1946. **Kellen Wiles** has been appointed executive assistant to G. C. Derry, general manager of the Sturtevant Div. of Westinghouse at Hyde Park, Mass. Mr. Wiles started with Sturtevant in 1934, then became associated with a subsidiary, Framingham Foundries, Inc., as general manager and later vice-president. When this operation was terminated in 1945, he joined the purchasing department, and most recently he has been factory accountant.

• **Herman J. Mauderer** has been elected vice-president and auditor of the Westinghouse Electric International Co., New York. **Arthur L. Partridge** has been appointed assistant to the president and **J. D. Mickle,** manager of the import department. Mr. Mauderer will have charge of all service functions such as accounting, traffic and warehousing. He joined the company in 1921 in the accounting department and 3 years later was named assistant auditor. In 1927 he was made auditor and in 1944 became auditor and budget director. Mr. Partridge will coordinate the entire import program with other company activities. He joined the company in 1941 as foreign exchange manager. In 1943 he was elected treasurer and in 1945 was appointed general manager of the import department. Mr. Mickle joined the company as a salesman in 1928. He was made manager of the Russian department in 1945 and assistant apparatus manager in 1946.

...OBITUARY...

• **John R. Van Fleet,** 66, chairman of the board of U. S. Vanadium Corp., New York, a unit of Union Carbide & Carbon Corp., died Nov. 10, after an illness of several months. He began his association with a unit of Union Carbide & Carbon Corp. in 1916.

• **James B. Knight, Jr.,** 65, president of the scrap metal firm of J. T. Knight & Sons, Inc., Columbus, Ga., died Nov. 10 after an illness of several months.

• **D. A. Crowley,** 53, chief metallurgist, Duquesne, Pa., works, Carnegie-Illinois Steel Corp., died suddenly Nov. 16.

• **John H. Morrison,** 68, vice-president in charge of sales of Warren Foundry & Pipe Corp., New York, died Oct. 29. He had been associated with the Warren Foundry & Pipe Corp. for the past 32 years.

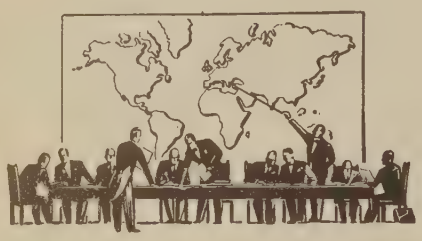
• **Ralph E. Scripture,** 65, president of the New England Metal Culvert Co., Palmer, Mass., died Nov. 15.

• **Stephen S. Herrick,** 77, founder and president of the Herrick Iron Works, Oakland, Calif., died Nov. 12 after a brief illness.

• **W. E. Sargent,** 72, retired treasurer of Cutler-Hammer, Inc., Milwaukee, died Nov. 4.

European Letter . . .

• Political trial is a means by which Communists justify themselves and impose themselves upon the people . . . Acquittal is unthinkable when ruling faction proclaims guilt of the accused by officially sponsored propaganda.



LONDON—After Petkov, Maniu; after Maniu, treason trials are promised in Czechoslovakia. Mikolajczyk has escaped from Poland, but substitute victims will no doubt be found for the cheated tribunal.

In the end, when the time is ripe, we may expect that the political process of law on the Moscow model will be extended to the Russian zone of Germany. There it will engulf those leaders who still resist the power of the Socialist Unity Party and expose the malignant designs of Britain and the United States against the German people.

The diffusion of the technique of the Soviet political trial has been one of the consequences of Communist ascendancy in Eastern Europe. This technique has been developed and elaborated over a period of years, but it has been devised in accordance with a basic conception of law which the Russian Communists already held in the time of Lenin.

Indeed, the view of the judicial function which underlies the procedure used in political cases was formerly expressed more frankly than it has been in recent years when propagandists have been at some pains to convince Western liberal opinion of the purity of justice as administered by the Military Collegium of the Supreme Court of the Soviet Union.

When once it has been theoretically established that *raison d'état* is the final principle of law and that the citizen has no legal rights which are valid against the interests of the ruling party, it becomes irrelevant whether an accused person has actually committed the offenses of which he stands accused.

A political trial of which the result is in doubt is obviously of no use to the Party-State; when, as always happens in these trials, the ruling faction has proclaimed the guilt of the accused by officially sponsored propaganda, acquittal is unthinkable. The defendants should not be brought to trial unless it is intended to convict them; the trial must demonstrate the theses of official doctrine and there can be no thought, therefore, of admitting testimony which upsets the prosecution.

It is not merely that the ruling faction, claiming absolute power, desires to destroy its political opponents physically and to discredit them morally. Even more, the political trial is a means by which the rulers justify themselves and impose themselves upon the people.

THE Russian Communists, basing their power so largely on mass propaganda, and possessing an untrammelled insight into the possibilities of modern technical means of publicity, such as the radio and cinema, were the first to grasp the importance of the political trial as a medium for appeal to the masses. There is nothing more dramatic—or melodramatic—than the proceedings of a court of law when men are in peril of their lives, nothing which can give so sharp and intense a form to the presentation of political issues.

If the proceedings can be so predetermined as to approximate to a planned, theatrical production; if they can be transmitted by camera, microphone and press reporting to the furthest corners of a vast territory, and if the government's monopoly of the means of publicity excludes any note of doubt or criticism of the evidence, then the holders of the state power have an incomparable medium for persuasion of the people.

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The propaganda effect is greatest if the accused can be induced to cooperate with the prosecution. Self-inculpating testimony is the most convincing of all. If the principal accused in a trial deny the charges in the indictment, it is desirable that the prosecution's chief witnesses should be men who also stand in the dock and denounce themselves in their evidence; it is the task of the Court to protect them from exposure to cross-examination or r e b u t t a l by obstructing, eliminating or intimidating the defense counsel and defense witnesses—as it has done in the trials of Mihailovitch and Petkov.

But the ideal is that all the accused without exception should confess their guilt and abase themselves with abject self-vilification, as in the trial of Professor Ramzin and his "Industrial Party" in Moscow in 1930, or in the later trials of the "Old Bolsheviks" in 1936-38. These well-conducted symphonies produced complete conviction in the minds of most Komsomoltsi, of many Bashkirs and of Ambassador Joseph Davies.

HOWEVER, the "shadow trial" of Trotsky, held by the "commission of inquiry" under Professor Dewey of Columbia University, subjected the evidence given in the Zinoviev-Kamenev and Pyatakov-Radek trials to a devastating critical analysis, which showed parts of it to be, by any standard of human reason, certainly false. The report of this commission has never, of course, been permitted to circulate within the borders of the Soviet Union, nor has it ever been widely read in Western countries—for the Moscow trials had long since ceased to be news before it appeared—but it remains as a massive rational refutation of stories told with ingenious detail, but without the essential quality of truth.

The report severely censures "the failure of the prosecutor and

the court to call the attention of the accused and witnesses to contradictions in their own testimony, or *between* their testimony and the facts of general knowledge, or between their testimony and that of other accused or witnesses, on matters of great importance to the credibility of the alleged conspiracy."

That part of the evidence in these trials is demonstrably false does not mean that none of it is true. Imagination makes its most successful flights when some facts are included in its diet. Under an authoritarian regime, even an opposition which desires to be constitutional can scarcely avoid straying into illegality, or being in some way mixed up with groups disposed to attempt a violent *coup d'état.*

There is evidence, apart from the Moscow trials, that a military conspiracy against Stalin was hatched among Red Army generals in 1936. But in this and other cases it is not enough for the ruling faction merely to establish the fact of conspiracy; for even though the government might be legally justified in executing the accused men, popular sympathy might still be with them. It is necessary to discredit them by attributing to them the basest motives and most despicable behavior, particularly by representing them as agents of foreign powers, ready to sell the interests of their country for power or money.

This fits in well with another purpose which can be served by political trials—that of impressing on the consciousness of the people real or imaginary threats from abroad.

PEOPLE may be induced to confess falsely—or to distort or add invented supplements to confessions of genuine guilt—for either personal or political reasons. In the former category come the motives which the normal man, who is not a political or religious fanatic, has for preserving his own life and the lives and liberties of his family.

In a totalitarian state, where the political police have powers of execution or consignment to concentration camps without trial—a power which can be extended arbitrarily to the near relatives or friends of the victim—the situation of an arrested man is the opposite of what it is under a normal legal system. In this country a man charged with a crime knows that his condemnation or acquittal depends on the effectiveness of his defense in court and that, if he is acquitted, nobody has any right to kill or imprison him. But in a totalitarian state he knows that he is at the mercy of the police—at least in political cases—that he can be killed or sent to a concentration camp without any public trial, proof of guilt, appeal or redress, and that the best hope of clemency is by pleading guilty when he is told to.

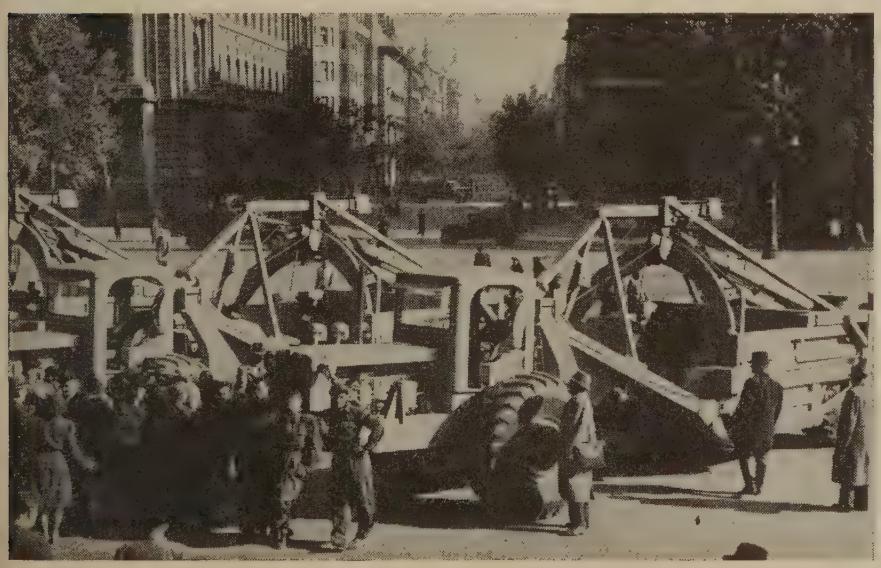
Political fanatics, however, cannot be subdued by such methods, and when a man's opposition to the regime is uncompromising, he must be either destroyed without public trial or given a trial *á la Petkov.*

But it may be that the opponents are men of divided purpose because, in spite of their desire to remove the government, they may support it in relation to something else; if they are men for whom the political consequences of their acts outweigh every other consideration, they may be persuaded by protracted argument to help the regime by their testimony. This is undoubtedly the main explanation of the extraordinary confessions of the old Bolshevik leaders. They hated Stalin, but they preferred Stalinism to Fascism, and they believed that the Revolution was in danger.

IN Eastern Europe today, with the Nazis overthrown, it will indeed be hard to convince opposition leaders, not schooled in the special ethics of Communism, that there is a greater evil than that which already holds power. It follows that we are unlikely to get, except from minor political personalities, the perfect unanimity of self-immolation achieved in the great Moscow trials.

The producers will have to fall back for the most part on the clumsier technique used in the Petkov trial; and it is right that these trials, in which Britain and the United States will be cast for roles of off-stage villains, should be fully reported by competent observers for the information of Western opinion.

EXPORT TO HUNGARY: *Lined up in front of the Ministry of Agriculture building, Budapest, are shown mechanical fertilizers from the United States. The manufacturers of the machines have sent an engineer with them to explain the working of the machines to the Hungarian farmers.*



Study European Recovery

New York

• • • **Appointment of a** subcommittee to study problems related to the European recovery program has been announced by Paul G. Hoffman, president of the Studebaker Corp. and chairman of the Committee for Economic Development.

The subcommittee has begun work on its study and will submit its findings to the CED Research and Policy Committee, of which Raymond Rubicam is chairman.

Industrial News Summary...

- **Postwar Record Seen in Steel**
- **Users Still Clamor for More**
- **Scrap Prices Down This Week**

DESPITE raw material shortages and time consumed in repairing and rehabilitating equipment, steel ingot output in 1947 will be 34½ pct greater than the previous peacetime peak in 1929, 61 pct greater than the prewar year of 1939 and about 30 pct higher than the year 1940 when the United States was shipping large amounts of metal to the Allies.

There is every indication that the total steel ingot output this year will amount to 85 million net tons, a figure only 5.1 pct below the all-time high during the war year of 1944 when steelmakers turned out 89.6 million tons of ingots. There is nothing in the picture now to prevent the 1947 record from being bettered in 1948. During the next 12 months some new ingot capacity will be installed, and finishing capacity will be expanded.

Unfortunately for the steel industry the temporary extreme tightness in steel supplies this month and expected in December is playing into the hands of those who are attempting to place rigid allocation controls over domestic steel output. Currently, pressure for steel deliveries from those consumers who are unable to keep their own production schedules at peak levels is the strongest since war days. Furthermore, the gray market is far more active than the black market was during the war and net prices are higher.

Conversion activity involving the processing of ingots and semifinished steel by one or more steel companies is now at an all-time peak. Yet practically all of this stringency which has been superimposed upon a strong normal postwar tight market has been due to loss of production in the industry this year through no fault of steelmakers. Practically all steel firms have been forced to clear their books of all promised tonnages which cannot be delivered before Jan. 1.

STEEL firms hope to start out the new year by promising no more than their production schedules will enable them to ship. If demand continues strong —and there is every indication that it will—there is no hope for any major change in the general steel supply and demand picture. But currently steel users are getting a far more equitable treatment than they could hope to receive under governmental fiat.

Some steel consumers this week were claiming that the much publicized quota system set up voluntarily by many steel companies in an effort to recognize historical purchases is breaking down. This is denied by steel sources. Consumers claim that some mills are picking and choosing those orders which show the best chance of reflecting long term and stable relationships.

Some segments of the automotive industry are claiming that many of their parts makers are not receiving enough steel with the result that auto firms in some cases are being forced to supply steel to their parts makers. While the automobile industry insists that it is paring down its inventories at an alarming rate in order to maintain high automobile output, other steel consuming groups are squawking about auto firms getting too much steel. Under present day conditions each major steel consuming group is indulging in finger pointing not only at the steel industry but at all other steel users.

AN ironic, although comic, offshot of the current steel picture is the swapping, selling, bartering and general utilization of steel inventories now going on amongst steel users. Some consumers do not need all the steel they are getting but they are helping out their suppliers on their customers—sometimes at a price. An industrialist with a carload of steel at his disposal is far more welcome in business circles than those who in the past have used other means to cement customer relationships.

With one eye on their dwindling stockpiles and the other on the apparent stabilization of scrap prices steel producers this week were in a position to win their second round in an obvious attempt to beat down scrap prices. Round one went to scrap consumers a few weeks ago when the upward spiral in scrap prices was halted. Round two has been won temporarily at least in some districts where the quoted price of heavy melting steel has declined over the past 2 weeks.

The general boycotting of high scrap quotations by consumers has driven prices down at Pittsburgh where the average price of No. 1 heavy melting this week has declined $2.50 a ton. At Philadelphia, where demand is still strong with brokers covering old orders, the average price of heavy melting steel is up 50¢ a ton, while the important Chicago district reflects no change.

THE IRON AGE steel scrap price composite is off 67¢ a gross ton this week and now stands at $40.58 per gross ton. This week's composite is $2 a ton below the all-time high reached in the week of Oct. 28. Just how long steel producers can stay out of the scrap market while their openhearths are chewing up large chunks of inventory remains to be seen. It appears, however, that the general effect of buyers' resistance plus the possible fear of government regulations has brought about a lower scrap price level for the time being at least.

Steel operations this week have sloughed off 1 point to 96.5 pct of rated capacity. This fluctuation was not significant of any major trend either way. Output is expected to be maintained at current levels until the Christmas holidays.

• **NEW BLAST FURNACE**—Pittsburgh Steel Co., has purchased the government's incomplete blast furnace at Monessen, Pa., for $2,126,000, WAA has announced. The sale also includes one of two turbo blowers located at Cleveland, to be installed at Monessen. Pittsburgh Steel will complete the furnace at an additional cost of approximately $1,300,000 and will begin pig iron production by May 1948. The blast furnace has a capacity of about 450,000 tons of pig iron per year. Pig iron production from this furnace will result in Pittsburgh Steel Co. purchasing 16,000 tons less of scrap each month and make possible production of 36,000 to 50,000 tons of steel ingots thereby augmenting steel supplies for tubing, plates, sheet and strip.

• **STRIP MILL ORDERED**—United Engineering & Foundry Co. has received a $20 million order for rolling mill equipment for the British steel expansion program. Wean Engineering Co., Warren, Ohio, is also sharing in the order under subcontract from United. The equipment will be used for a $120 million steel plant which is being erected on a 1600-acre site at Port Talbot, Wales, and is expected to have a capacity of 1,500,000 tons of steel a year, or about one-tenth of British steel production.

• **RESIGNATION**—Resignation of General Robert M. Littlejohn as administrator of War Assets Administration, effective as of Nov. 28, has been accepted by President Truman. Deputy Director Jess Larson will assume the job of acting administrator of the disposal agency which is slated for liquidation next June. At that time, inventories of surpluses are expected to be down to little more than $3 billion, consisting largely of real property.

• **GOVERNMENT EXODUS**—Continental reports indicate that plans are underway to liquidate the Italian government's financing in business and to transfer to private industry the Finsider interests. This would be an indication of the unwillingness of the predominant right wing elements of the Italian government to sanction participation in industry by the government.

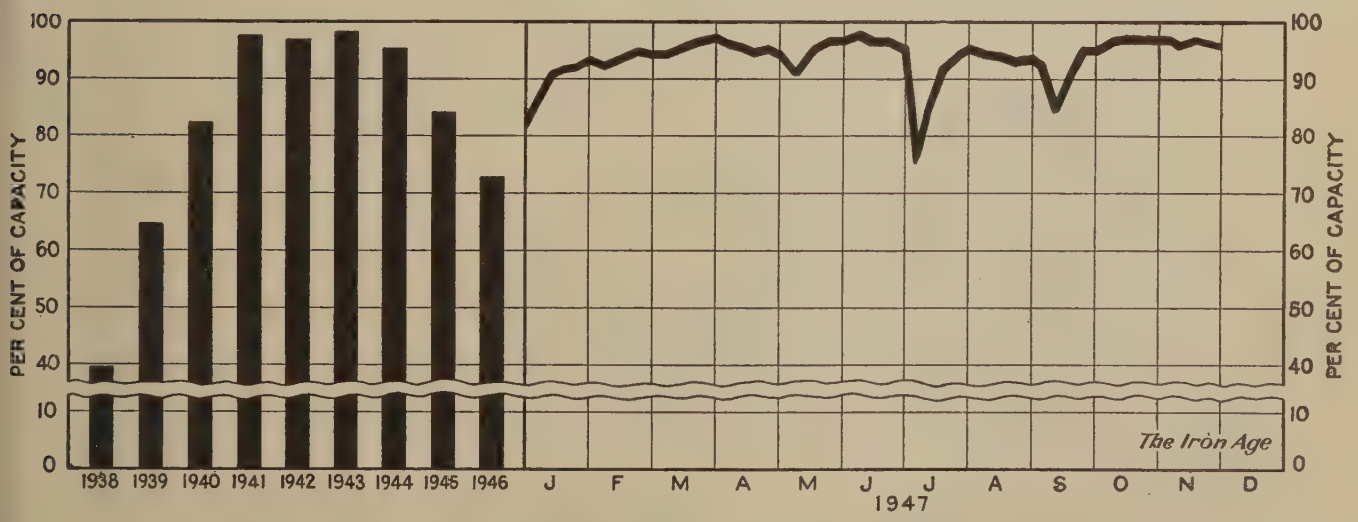
• **NEW ALLOY EXTRAS**—Effective Nov. 17, Republic Steel Corp. has announced revision in extras for alloy content in certain of its hot-rolled alloy and special steels. There has been no change in base prices. This action reflects recent increases in the prices of ferroalloys. Changes have also been announced in some of the size extras for round, square and hexagon alloy bars and in one range of alloy blooms, billets and slabs.

• **PETROLEUM TANK CARS**—It has been estimated that 7500 low pressure cars for petroleum transportation are required to bring the fleet of such cars up to prewar level. And such a capacity is still considered inadequate with the present demand for oil products running about 30 pct over 1941 levels. The situation looks increasingly critical as 6000 cars of this type have necessarily been removed from service over the last year. None of this type has been built since 1945.

• **FULL BLAST**—Last week for the first time in peacetime history all 41 of U. S. Steel's blast furnaces in the Pittsburgh-Youngstown area were in blast. The figure was achieved when Carnegie-Illinois' Ohio Work at Youngstown blew in its new No. 4 furnace. Only once previously, for a short time during World War II, were all the corporation's furnaces in the district in operation. A feature of the new Youngstown unit is carbon block construction for the hearth. Rated daily capacity of the No. 4 furnace, which was blown in Nov. 20, is 900 tons. Its predecessor, built in 1904 made seven campaigns for a total of 2 million tons of iron.

• **COMPLAINT DISMISSED**—A Federal District Court has dismissed a Justice Dept. complaint alleging that acquisition of Consolidated Steel Corp., West Coast fabricator, by U. S. Steel Corp. would be monopolistic. This does not close the case. The government can appeal the case to the U. S. Supreme Court, and there are indications it may do so. Even if an appeal is not filed within 60 days of the Nov. 7 District Court decision, several months more would be required before U. S. Steel could complete acquisition of Consolidated.

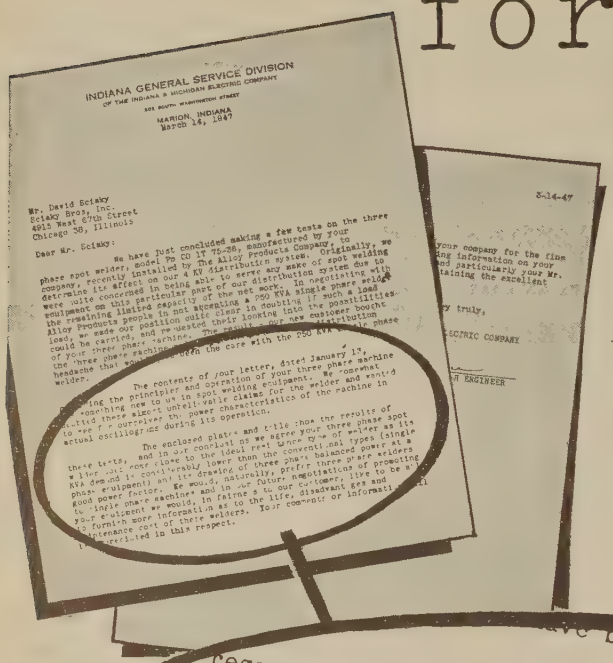
Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
November 18...	103.0	95.0	93.0*	95.0	98.5*	102.0	102.0	102.0	101.0	110.0	103.0	80.0	94.0	97.5
November 25...	103.0	95.5	92.5	95.0	97.5	102.0	90.0	99.0	101.0	107.5	98.5	80.0	94.0	96.5

* Revised.

"We wanted to see for ourselves"



INDIANA GENERAL SERVICE DIVISION
OF THE INDIANA & MICHIGAN ELECTRIC COMPANY
101 SOUTH WASHINGTON STREET
MARION, INDIANA
March 14, 1947

Mr. David Sciaky
Sciaky Bros, Inc.
4913 West 67th Street
Chicago 38, Illinois

Dear Mr. Sciaky:

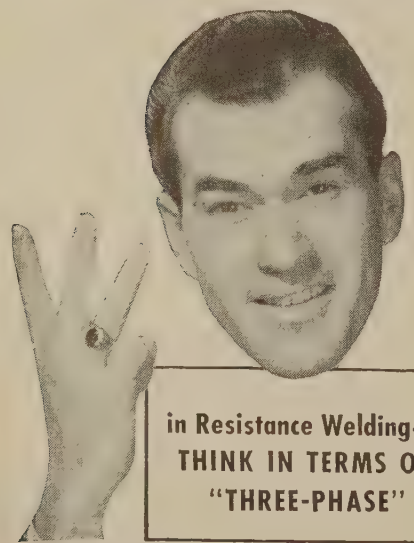
We have just concluded making a few tests on the three phase spot welder, model No CO 17 75-36, manufactured by your company, recently installed by The Alloy Products Company. Originally, we were quite concerned in being able to serve any make of spot welding equipment on this particular part of our distribution system due to the remaining limited capacity ... In negotiating with The Alloy Products people in connection with the possibilities of your three phase machine ...

The contents of your letter, dated January 13, regarding the principles and operation of your three phase machine was something new to us in spot welding equipment. We somewhat doubted these almost unbelievable claims for the welder and wanted to see for ourselves the power characteristics of the machine in actual oscillograms during its operation.

The enclosed plates and table show the results of these tests, and in our conclusions we agree your three phase spot welder does come close to the ideal resistance type of welder as its KVA demand is considerably lower than the conventional types (single phase equipment) and its drawing of three phase balanced power at a good power factor. We would, naturally, prefer three phase welders to single phase machines and in our future negotiations of promoting your equipment we would, in fairness to our customer, like to be able to furnish more information as to the life, disadvantages and maintenance cost of these welders. Your comments or information will be appreciated in this respect.

ORCHIDS to the Indiana & Michigan Electric Company! A new customer required a 250 KVA resistance welding load—a load which would overtax their 4 KV distribution system in that area. Instead of not accepting the load, the power company suggested the installation of a Sciaky "THREE-PHASE" welder. They then made a thorough test, complete with oscillographs. They *saw for themselves* that the "THREE-PHASE" machine produced the necessary welding heat with *½ the KVA demand* and *¼ the line current* required by a single phase welder. Further, the "THREE-PHASE" welder operated on a *balanced three phase load at near unity power factor.*

Result: The power company was able to gain a customer—the manufacturer was able to gain greater welding efficiency without adding expensive power distribution equipment.



**in Resistance Welding—
THINK IN TERMS OF
"THREE-PHASE"**

If you have a resistance welding power problem, find out about this exclusive Sciaky development. There is a complete line of standard machines to meet your every requirement. Investigate "THREE-PHASE" . . . . . .

Write for descriptive bulletins 136 and 137

SCIAKY

**SCIAKY BROS., Inc.
4913 W. 67th St., Chicago 38, Ill.**

Special Report . . .

Third Wage Round Apparition Making Its Appearance

By TOM CAMPBELL
News-Markets Editor

o o o

New York

• • • **The apparition** of the third round of wage increases may be ectoplasm now but by the first of the year it may take bodily form according to soundings made in the cloak room.

Brass of some of the largest companies are probably trying to decide what answer they will give to wage demands next year which they know are coming. The handwriting looks as if they have to get an answer before long.

As far as labor is concerned it is a foregone conclusion that unions will ask for higher wages. The reason given will be to compensate for the higher costs in living since the last wage hikes were granted.

No matter which industry tries to dodge the issue so as not to be first, it is certain that whatever the steel industry does will be the general pattern. Steelmen would want it otherwise but what they want they don't always get.

The 12½¢ an hr increase granted this month in the clothing industry may be more than a straw in the wind—it may be the wind itself. Fear on the part of the unions that they will be blamed for another inflationary spiral is not a major factor in the picture. Their argument is that prices have gone up much faster and farther than wage increases.

On the other hand, industry will be in the doghouse if it raises prices again to compensate for wage increases it might be forced to grant. Both labor and industry privately feel that there will be no price or wage ceilings in the near future.

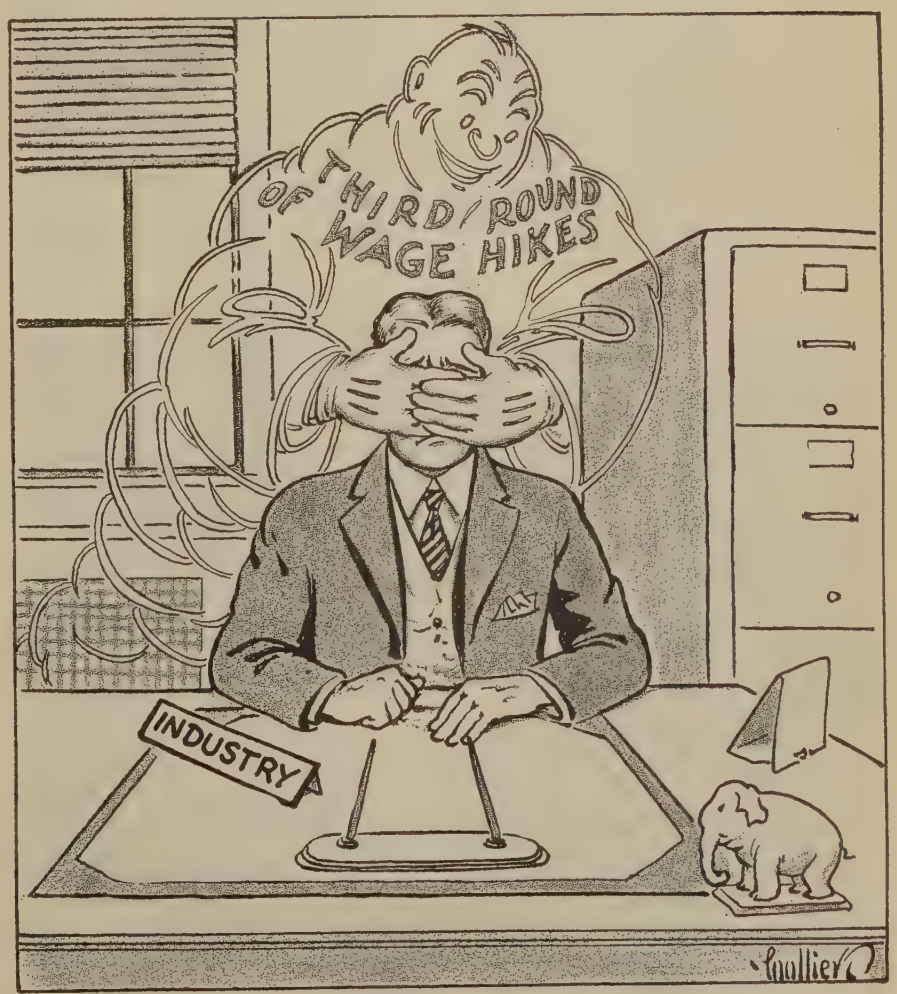
But the aspects of the Marshall Plan have a little more to do with what might happen to wages than is generally supposed, according to some labor leaders. When $20 billion is invested as insurance to keep the communists from overrunning Europe, no one is going to let anything happen that will sabotage the investment. The public, the unions and industry are in no mood to have strikes, stoppages or loss of output next year.

Just how industry, notably the steel industry, would settle on a moderate wage increase, and at the same time hike prices enough to at least partially pay for this and yet not have the seven-alarm fire bell ring, is something that will be figured out between now and Apr. 1. At that time the official notice from the steel union will go forth asking for a wage conference.

But long before Apr. 1 the whole price-wage picture will be cut and dried and "contacts" between labor and management will probably have been made to sound each other out. The issue will be sharp and clear because it will involve wages only—the rest of the contract is frozen until 1949.

It is true that if no agreement is reached in wages, according to the contract, the old rate is to be extended for another year. That is academic in the minds of labor leaders and some industrialists. Furthermore, most wags remind everyone that 1948 is an election year. No one must rock the boat,

"Guess Who?"



either in this country or in Europe.

Of course, as oldtimers say, there will be plenty of window dressing between now and the final outcome of the steel wage negotiations. The following is no attempt to shine the crystal ball, but is a roundup of the way it looks to some who will be in the middle of the picture before long.

(1) THE PREVIEW—Period between now and early next year when everyone in industry will think deeply, worry a lot, snarl at their kids and wonder how many, if any, cents per hour they will have to advance wages. Strategy on who can be pushed up ahead to make the decision first will be done to a crisp—and it looks like Big Steel will again have to take the lead because other steel leaders don't want to take the rap.

(2) THE CONTACT PERIOD —After the first of the year, and before Apr. 1, there will be rumors and reports of "secret" meetings between industry and labor as they feel each other out. At least, the bold framework or the roughing of the foundation will be laid. It always is because, by just talking to each other about the weather, both sides will gain something they did not have before.

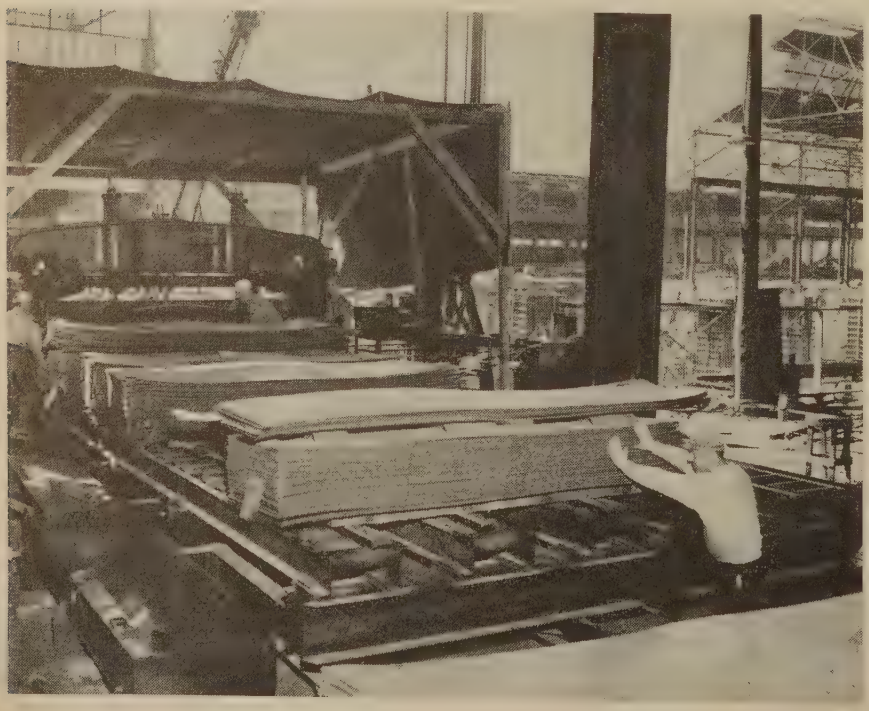
(3) THE DRUM-BEATING PERIOD—Both sides will fire the artillery. Cost of material will be cited, high costs pointed out, lower efficiency will be explained and very workmanlike (by far the best jobs done yet) exposition of management's side will be made. The union will haul out the living cost index, the high food prices, disclaim the responsibility for inflation, condemn the government for lack of controls and do the best job yet on trying to persuade the public they are right.

(4) THE HAGGLING PERIOD—Just prior to the final decision on wages in steel (auto industry may come out first but steel will be the watchword) last-minute hitches appear in the picture. At that time industry must weigh the power it has or does not have in the signed agreement that if no wage rates are agreed on the contract reverts to current wages until April 1949. The union must take stock of what they will do if their request is turned down. Crises are always surmounted. They will be this time.

Anything can happen to upset the above timetable but there are very few new ways of doing old things and both management and labor have been at it now for 10 years, at least via the "new" way.

The two major factors that seem to indicate that there will be no major labor incident in 1948 are the need to protect the Marshall Plan investment and the fact that the election for president takes place. The chances of a third round of wages and higher prices in 1948 are more than 50-50.

OPEN AIR PRODUCTION: *Even though the Columbia Steel Co. is turning out steel sheets under canvas at its Pittsburg, Cal., plant, it is not a three-ring circus, according to the men who are trying to keep production rolling on the old mills while a $25 million expansion program goes on. The new mill is being built around the old stands which will continue to operate as long as possible.*



Philadelphia Scrap Men Reelect Past Officers

Philadelphia

• • • **At its recent** meeting the Philadelphia chapter of the Institute of Scrap Iron & Steel Inc. reelected the following officers: president, John T. Hunt, M. J. Hunt's Sons, Philadelphia; vice-president, Harry Stave, Stave Bros., Philadelphia; treasurer, Dominic J. Giordano, Giordano Iron & Metal Co., Camden, N. J.; secretary, Marcus J. Margulies, Luria Steel & Trading Corp., Philadelphia.

The following were elected to the executive committee: Abe Pollock, Mayer Pollock, Pottstown, Pa.; Joseph Bantivoglio, Camden Iron & Metal Co., Camden, N. J.; Thomas Marchisello, Ace Iron & Metal Co., Camden, N. J.; William L. Forebaugh, Luria Bros. & Co. Inc., Philadelphia; Walter S. Gates, Charles Dreifus Co., Philadelphia.

Engineers to Report Engineering Progress

Philadelphia

• • • **The Engineers' Club** of Philadelphia Junior Members are joining with the Franklin Institute in sponsoring a second Engineering Progress Show May 11 to 16. Exhibits will include many items depicting the progress in engineering.

The show will be held in the Franklin Institute. Two nationally prominent engineers will deliver lectures in the Franklin auditorium on two evenings during the week. Exhibitors are now contracting for group space.

Republic President Says No Excuse Exists for Higher Scrap

Cleveland

• • • **Price of heavy** melting steel should be no more than $35 a ton in Youngstown and $34 a ton in Chicago, according to Charles M. White, president, Republic Steel Corp.

This was Mr. White's answer to the question, asked him by THE IRON AGE, "Under present conditions, what do you think the price of heavy melting steel should be in Youngstown? in Chicago?"

Mr. White pointed out that the OPA price was $20 and since the removal of price controls steel prices have actually gone up far less than the 75 pct increase these suggested prices allow.

"The demand today may be sufficient to justify such prices, but anything beyond this is unjustifiable. Increasing the price of scrap is not producing any more scrap," he stated.

Q. Do you think there is enough iron and steel scrap from any and all sources to meet the requirements of the present high rate of steel making operations?

A. "Yes, if properly distributed."

Q. If you think there is enough scrap to maintain present operations, what factor or factors are responsible for the present scrap prices?

A. "Since some mills engaged in conversion deals don't care what they pay for scrap (because this is charged back to the customer) the brokers who sell to these mills are constantly trying to out-bid each other for scrap purchases. This is the principal reason for present scrap prices."

Q. Since under the law there can be no unanimity of action on the part of steel producers in "breaking" the present scrap market, what other alternative is there for the average producer short of taking off open hearth furnaces?

A. "There is no alternative. Equitable distribution of existing scrap is the only sensible solution to the present situation."

Q. How can the average steel producer increase his scrap shipments? How can the steel industry get more scrap moving, or what would be your plan to accelerate or expedite the flow of scrap into the steel mills?

A. "Only by re-emphasizing and re-publicizing the seriousness of the scrap shortage and urging every industrial plant to turn in all scrap immediately to legitimate dealers.

Conversion Deals Have Serious Effect on Price Levels; Bidding Continues

o o o

Q. In view of the urgency and enormity of the demand for steel, should the government step into the scrap situation, or permit the industry to co-ordinate its buying, or take some other seemingly collusive action to bring scrap prices down and shipments up?"

A. "No, for many reasons. Among others that it would take at least a year to get a program under way."

Q. What do you think about bringing scrap back from overseas? Do you consider that any of the present plans for doing this are economically feasible?

A. "We should not bring scrap back if it means that we should return it to Europe under the Marshall Plan . . . otherwise Yes."

Q. Can the law of supply and demand be discarded in the present scrap market, as some consumers have tried to do?

A. "Certainly not."

Q. Isn't the law of supply and demand really responsible for the present price of scrap?

A. "Only up to a certain point. There is a sufficient supply of scrap to keep the price within reason, providing it is made available on an equitable basis."

Steel Executives Give Harriman Their Views On Government Action

Washington

• • • **Steel industry** executives met on Tuesday of this week with Commerce Secretary W. Averell Harriman to discuss what part the Dept. of Commerce could play in helping to "maintain maximum steel production" and conserving steel "for the most important uses."

The meeting, called by the Secretary, was designed to give the Department the industry's view on what is needed from the government if present demands—domestic and foreign—are to be met, according to information received by THE IRON AGE.

The opinions expressed by the industry will be incorporated by Commerce in its recommendations to the White House, which in turn will guide White House thinking in preparing legislation designed to carry out the European Recovery Program.

Commerce, anxious to avoid all but the barest minimum of control, has asked the industry if such devices as accelerated depreciation, subsidies and tighter export controls on steel and coking coal would be of help in stimulating production.

Companies represented at the meeting included: U. S. Steel Corp., Bethlehem Steel Co., Bliss and Laughlin, Inc., Kaiser Co., Inc., Jones & Laughlin Steel Corp., Colorado Fuel and Iron Corp., Youngstown Sheet & Tube Co., Inland Steel Co., National Steel Corp., and Republic Steel Corp.

Copperweld Will Halt Alloy Products Sales

Warren, Ohio

• • • **Copperweld Steel Co. will discontinue the sale of alloy, tool steel, and stainless bars Dec. 31, according to a company spokesman.**

This action is being taken because recent changes in prices have not adequately reflected increases in labor and scrap prices. Copperweld has been selling about 5000 to 6000 tons of alloy billets and ingots a month.

Rumors that Copperweld Steel Co. is planning to install a new blooming and bar mill have been circulating through the trade the last few days, but company sources refused to either confirm or deny these reports.

It is known that Copperweld officials have at least plans for a blooming and bar mill under consideration, awaiting final approval by the board of directors. If the project is approved, Copperweld will be able to roll directly many of the light sections which are being produced by double conversion at the present time.

Pressed Metal Group and Republic Head Battle on Steel

White Says Charges That Steel Subsidiaries Get Best Deal Are "Blue-Sky Hokum"

o o o

By BILL LLOYD
Cleveland Regional Editor

o o o

Cleveland

• • • **Charles M. White**, president, Republic Steel Corp., proved more than a match for Tom J. Smith, Jr., president of Pressed Metal Institute, and one of the steel industry's most outspoken critics, in a much heralded battle of words before Cleveland district PMI members at their fall-winter-spring meeting here Monday night.

Mr. White, who had delivered his address first, returned to the platform following Mr. Smith's remarks, to answer directly Mr. Smith's charges of banker domination of the steel industry, the gray-black market connections of major steel producers, unfairness of the multiple basing point system, and PMI's role in unearthing the inequities of flat rolled product distribution.

Branding such charges as cock-eyed, Mr. White emphasized that he was not in accord with the thinking that anything anybody says in Washington is right, or that "the things your president (Smith) thinks are right," he told PMI members.

"In fact," he said, "I can't figure out from what Mr. Smith says if you people want the multiple basing point system or not."

He then declared that he would answer an allegation or charge any PMI member cared to make against Republic Steel Corp.

In the spirited debate that followed, Mr. White, in answer to questions, said that galvanized sheets would be one of the last products rolled; that withdrawn tonnage from areas where Republic no longer ships goes to regular customers that are behind; that Republic is not taking any more orders for the rest of this year.

Mr. Smith, who opened his remarks with a text from *Holy Writ*, delved into government reports, the 1933 banking crisis, and the actions of certain steel company officials to suppress the PMI campaign which eventually "came to the attention of the Federal Trade Commission," and the steel sub-committee of the Special Committee to Study the Problems of American Small Business.

He also touched on the subject of stamped bath tubs, a government grant of some $15,000,000 to Lustron Corp. to produce porcelain enameled steel houses, and the substitution of aluminum for steel in the washing machine industry.

Mr. White pointed out, in his prepared address, that national steel production cannot increase by more than a million tons in 1948, even though steel capacity in 1947 and 1948 will have been increased by 2,500,000 tons of ingots and three million tons of sheet and strip.

Mr. White said that while this increased production will alleviate the tight situation to some extent, total steel production will be several million tons short of the effective demand in 1948, and that 1948 will be a repetition of 1947 as far as steel availability is concerned.

He said Republic's most recent survey of major industries shows effective steel demand for the 12 months beginning Sept. 1, 1947, to be about 66.5 million tons of finished steel, and next year's production cannot greatly exceed this year's 62 million tons.

"How long will this acute shortage exist? It is my judgment at the moment that two years from now we will see many of the war-engendered shortages filled," Mr. White predicted.

Branding the charge that the steel industry is engaged in a program of planned scarcity as absurd, Mr. White said the steel industry is squeezing out every ton that can be produced from existing plants. Total production this year will be an all-time record for peacetime.

"I come now to another category in which we have been pilloried by your president, our fabricating divisions.

"The statement has been made recently that we are pouring steel into our own fabricating plants while the independent fabricators starve. I can't speak for the steel industry, but I can speak for Republic. This charge is . . . contrary to the facts, and to my knowledge, no attempt has ever been made to get the truth.

"What has been ladled out to you and to some of the Washington committees is just pure, blue-sky hokum as far as Republic is concerned, and I am reasonably sure that this applies to most of the major steel producers."

In the 1939-1940 prewar period, our fabricating divisions received 8.7 pct of our total shipments. In 1947, they have received 6.8 pct, a decrease of almost two pct. Not one of these plants is operating even close to capacity, he reported.

"A check of the PMI roster shows we have been shipping steel to 54 of the active member companies. Our records show that in 1946 we shipped to these 54 stampers a substantial increase over their base period tonnage with us.

"In 1947, if we maintain the rate, we will ship an even greater increase over their base period tonnage."

Touching on the black market, Mr. White said no accurate estimate could be made of its extent, but he said the two million tons publicized by Tom J. Smith, Jr., president of PMI, and repeated over and over again is undoubtedly believed by the uninformed, but that figure, according to Mr. White, is absolutely fantastic. He said that two million tons is more flat rolled steel than the combined jobbers in the U. S. will receive in 1947.

No such tonnage could be lifted out of established distribution channels without causing a complete breakdown of industrial production.

Mr. Smith in his remarks told members that the stamping industry generally cannot secure from steel mills and warehouses adequate sheet and strip to meet the demand for stampings and in end products needed by the consumer because of the diversion of sheet steel to gray markets.

He also cited as reasons unequal allocation of sheet steel by steel mills between owned stamping companies and independent stampers; shortage of scrap, refusal of certain steel producers to ship directly to small users; refusal of certain

(CONTINUED ON PAGE 122)

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1947

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter	*18,989,581*	*95.0*	*1,077,901*	*84.8*	*875,312*	*69.9*	*20,942,794*	*93.1*	*1,628,522*	*12.86*
April	6,360,600	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,64 54	4.29
May	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd Quarter	*19,307,990*	*95.5*	*1,099,800*	*85.5*	*933,069*	*73.7*	*21,340,859*	*93.7*	*1,640,343*	*13.01*
1st 6 Months	*38,297,571*	*95.3*	*2,177,701*	*85.2*	*1,808,381*	*71.8*	*42,283,653*	*93.4*	*1,634,467*	*25.87*
July	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
August	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
* September	6,147,448	92.4	334,425	79.0	306,769	73.6	6,788,642	90.6	1,586,131	4.28
* *3rd Quarter*	*18,500,611*	*90.7*	*936,583*	*72.2*	*903,688*	*70.7*	*20,340,882*	*88.5*	*1,549,191*	*13.13*
* *9 Months*	*56,798,182*	*93.7*	*3,114,284*	*80.8*	*2,712,069*	*71.4*	*62,624,535*	*91.8*	*1,605,757*	*39.00*
† October	6,831,508	99.3	384,272	87.8	348,522	80.8	7,564,302	97.6	1,707,517	4.43
November										4.29
December										4.42
4th Quarter										*13.14*
2nd 6 months										*26.27*
Total										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

* Revised
† Preliminary figures, subject to revision.

YEAR 1946

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		*Calculated weekly production, all companies (Net tons)	Number of weeks in month
	*Net tons	Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	Percent of capacity		
January	3,530,192	51.1	207,512	47.4	135,183	28.9	3,872,887	49.6	874,241	4.43
February	1,301,719	20.9	25,905	6.6	65,058	15.4	1,392,682	19.8	348,171	4.00
March	5,950,241	86.2	363,949	83.1	194,574	41.6	6,508,764	83.3	1,469,247	4.43
1st Quarter	*10,782,152*	*53.8*	*597,366*	*47.0*	*394,815*	*29.1*	*11,774,333*	*51.9*	*915,578*	*12.86*
April	5,336,317	79.8	286,088	67.5	238,790	52.8	5,861,195	77.5	1,366,246	4.29
May	3,702,184	53.6	153,409	35.0	217,027	46.4	4,072,620	52.2	919,327	4.43
June	5,148,660	77.0	251,253	59.2	225,860	49.9	5,625,773	74.4	1,311,369	4.29
2nd Quarter	*14,187,161*	*69.9*	*690,750*	*53.7*	*681,677*	*49.7*	*15,559,588*	*67.9*	*1,195,971*	*13.01*
1st 6 months	*24,969,313*	*61.9*	*1,288,116*	*50.4*	*1,076,492*	*39.4*	*27,333,921*	*59.9*	*1,056,588*	*25.87*
July	6,027,388	87.5	365,332	83.6	225,963	48.5	6,618,683	84.9	1,497,440	4.42
August	6,291,363	91.1	373,837	85.4	259,322	55.5	6,924,522	88.7	1,563,098	4.43
September	5,951,232	89.2	371,465	87.8	232,869	51.6	6,555,566	86.9	1,531,674	4.28
3rd Quarter	*18,269,983*	*89.3*	*1,110,634*	*85.6*	*718,154*	*51.8*	*20,098,771*	*86.8*	*1,530,752*	*13.13*
9 months	*43,239,296*	*71.1*	*2,398,750*	*62.2*	*1,794,646*	*43.6*	*47,432,692*	*69.0*	*1,216,223*	*39.00*
October	6,312,604	91.4	387,933	88.6	251,205	53.8	6,951,742	89.0	1,569,242	4.43
November	5,873,264	87.8	318,350	75.1	266,157	58.8	6,457,771	85.4	1,505,308	4.29
December	5,286,799	76.7	222,704	51.0	250,998	53.8	5,760,501	73.9	1,303,281	4.42
4th Quarter	*17,472,667*	*85.3*	*928,987*	*71.5*	*768,360*	*55.4*	*19,170,014*	*82.8*	*1,458,905*	*13.14*
2nd 6 months	*35,742,650*	*87.3*	*2,039,621*	*78.5*	*1,486,514*	*53.6*	*39,268,785*	*84.8*	*1,494,815*	*26.27*
Total	60,711,963	74.7	3,327,737	64.6	2,563,006	46.6	66,602,706	72.5	1,277,382	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

* Revised January through December, 1946.

Tool Builders Discuss Effects of Government on Future Sales

Also Adopt Eight-Point Tax Revision Program After Electing Officers

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By T. E. LLOYD
Machinery Editor

o o o

Hot Springs, Va.

• • • A. G. Bryant, vice-president of Cleereman Machine Tool Co., Chicago and Green Bay, Wis., and president of Bryant Machinery and Engineering Co., Chicago, was elected president of the National Machine Tool Builders' Assn. on Nov. 18 at the annual meeting of the association. Lloyd D. McDonald, vice-president of Warner & Swasey Co., Cleveland, was elected first vice-president of the association; and David Ayr, president of Hendy Machine Co., Torrington, Conn., was elected second vice-president.

A. G. Bryant

Louis Polk, president of Sheffield Corp., Dayton, was reelected treasurer; Frida F. Selbert was reelected secretary; and Tell Berna was reappointed general manager of the NMTBA. New directors elected were David Ayr; Harold B. Smith, president of Illinois Tool Works, Chicago; and M. A. Hollengreen, executive vice-president and general manager of Landis Tool Co., Waynesboro, Pa.

Climaxing a series of discussions mainly on futures sales possibilities and the attitude of government toward business was a motion, unanimously carried, that an eight-point program of federal tax revision be adopted as the association's official position and be presented to Congress for consideration when the tax law comes up for revision.

The adopted program included liberalization of depreciation; repeal or modification of the penalty tax on unreasonable surplus accumulation; a 3-year carry-back and 6 year carry-forward; an immediate ceiling of 60 pct on surtax rates and an ultimate ceiling of 50 pct; reduction of capital gains tax; elimination of double taxation on corporate dividends; extension of the community property principle; and elimination of the provisions under which life insurance, carried for inheritance taxes, is included in the taxable estate.

It was anticipated that the work of War Assets Administration in disposing of surplus machine tools would be completed by June 30, 1948, while the JANMAT reserve of tools that are being held for national emergency will be shipped by Mar. 15, 1948. From March to September 1947, 1,890,000 tons of scrap have been sold from surplus, some of which were unsalable machine tools. Another 1,332,000 tons are expected to be sold by July 1948. WAA had about 126,000 machines of which JANMAT will take some 92,000, leaving about 34,000 to be disposed of as scrap or salvage.

Concern was expressed at the NMTBA annual meeting over the attitude of the American government as to foreign sales. The export policy of WAA on surplus machines for foreign countries is to sell machines on an "as is-where is" basis, and no dollar credits have been established for these

(CONTINUED ON PAGE 120)

50 YEARS AGO

THE IRON AGE, *November 25, 1897*

• "The marvelous rapidity with which the patent office turns out patents on articles supposed to relate more or less to bicycle improvements, causes wonderment wherever it is noticed. Day after day applications are made in scores for protection on intended bicycle revolutionizers, or appliances of some sort. Day after day patents are granted on these same marvels of simplicity or complicacy. Half of them are worthless. Nine-tenths will never be used. There can be no doubt that the press and the patent attorneys are at the bottom of the thing."

• **"Horseless Carriage—A. H. Overman, of the Overman Wheel Co., has, after long experimenting and testing, developed a new horseless carriage. The machine is propelled by a hydrocarbon gas engine, generating its own power without smoke or order, and at a cost of less than ½¢ per mile. The machine develops 4 hp and attains a speed of 30 mph."**

• "Something entirely new in the way of steam and trolley car wheels may be seen at the Bourse Bldg. in Philadelphia, where a machinery exhibition is in progress. The entire wheel from the hub to the flange is forged from a solid steel ingot, making the hub, center, tire and flange all in one piece."

• **"The Mond gas producer and recovery plant recently designed not only employs cheap bituminous fuel, but recovers from it 90 lb of sulphate of ammonia per ton, and yields a gas eminently suitable for use in gas engines and applicable to all classes of furnace work."**

• "The world's record for the greatest number of heats in a steel works has just been broken at the new Bessemer plant of the Cambria Iron Co., Johnstown, Pa. Ninety-four heats were made, breaking the record of 92 set by Carnegie Co. at their Homestead Mills. Over 1044 tons of steel were produced in 14 hr."

Tariff Benefits and Concessions Summarized by State Dept.

Automobiles and Parts Get Most Advantages as the British Preferences Go Down

Washington

• • • **The American** metalworking industry should derive considerable benefit from tariff concessions made by countries participating in the General Agreement on Tariffs and Trade, according to a detailed analysis released by the State Dept. last week.

While exchange shortages may delay the full effect of the 23-nation agreement concluded at Geneva on Oct. 30, the State Dept. believes that the rules of international trade conduct and reduction of tariffs agreed to by the participating countries eventually will result in lower prices for imported commodities and freer access to world markets for American firms.

Specifically, American negotiators regard with pride concessions obtained from 14 participating nations on automotive vehicles. Important concessions were obtained from nine nations on machinery items and from six nations on machine tools. Tractors and aircraft were also high on this list.

However, the granting of concessions was not a one-way street, as can be seen from the following selected list of commodities on which the United States met foreign negotiators more than half-way, by agreeing to the concessions noted:

Pig iron containing more than 0.04 pct phosphorus—The base rate of duty on this grade was reduced from $1.125 per long ton to $0.75 per long ton.

Steel ingots, blooms, billets, bars and all other steel products valued at not above 3½¢ per lb—The base rate on products valued at not over 1½¢ per lb was reduced from ¼¢ per lb to ⅛¢ per lb.

The base rates on products valued above 1½¢ and not above 2½¢ per lb (ingots and slabs) were reduced from ⅜ or 2/5¢ per lb to 3/16 or 1/5¢ per lb, respectively. The base rate on products valued above 2½¢ and not above 3½¢ per lb (such as shapes, skelp, bars) was reduced from 20 to 10 pct ad valorem.

Unfabricated structural shapes of iron or steel—The base rate (additional duties are seldom imposed) was reduced from 1/5 to 1/8¢ per lb. The new base rate is the same as the new minimum base rates on iron bars, and steel bars and all other products covered in the above paragraph, thus tending to minimize tariff litigation.

Iron and steel hoop, band, and scroll valued at 3¢ per lb or less—The base rate on hoop, band, and scroll 0.375-0.109 in. thick was reduced from 0.25 to 0.15¢ per lb. The base rate on products 0.109-0.038 in. thick was reduced from 0.35 to 0.20¢ per lb. The base rate on products thinner than 0.038 in. thick was reduced from 0.55 to 0.30¢ per lb.

This account is only a brief summary of major commodities of interest to the metalworking industry covered by the Trade Agreement. The entire agreement covers some 45,000 items and of these the United States granted or received concessions on about 3500 to 4000. The State Dept. summary on which this account was based covered only commodities in which the United States had a primary interest. The complete agreement in four volumes entitled "General Agreement on Tariffs and Trade" is being sold for $5 by the International Document Service, Columbia University Press, 2960 Broadway, N. Y., and by the United Nations Sales Section, Lake Success, Long Island.

Iron and steel baling hoops and bands—The rate of duty was reduced from 0.2¢ to 0.15¢ per lb.

Steel ingots, blooms, billets, and bars, and all other steel products valued above 16¢ per lb—The base rate on products valued above 16¢ per lb was reduced from 20 pct to 15 pct ad valorem.

Alloy steel or iron—The additional ad valorem rate of 8 pct on products valued at not above 3½¢ per lb and on those valued above 8¢ per lb was reduced to 4 pct. The specific rates on the dutiable content of vanadium, tungsten, and chromium were also reduced to compensate for corresponding reductions in the rates on the raw materials.

Metal-working machinery—This group covers practically all machinery used in producing any semifinished materials, articles, or machines made of metal. All of these machines, with three exceptions, were dutiable at 30 pct under the act of 1930. This rate was reduced in the new agreement to 15 pct. The exceptions are: (1) Gearcutting or hobbing machines; (2) punches, shear, or bar cutters, the duty of which has now been reduced from 40 to 20 pct; and (3) jig borers, the duty on which remains at the 15 pct rate established in the agreement with Switzerland in 1936.

Tungsten ore and concentrates—The rate of duty was reduced from 50¢ per lb to 38¢.

Bauxite—The rate of duty was reduced from $1.00 per ton to $0.50 per ton.

Aluminum, crude—The rate of duty was reduced from 3¢ per lb to 2¢ per lb.

Manganese ore containing 35 pct or more metallic manganese—The duty was reduced from ½¢ per lb of manganese content to ¼¢ per lb of manganese content.

Copper ore, concentrate, matte, blister, refined and old scrap—The import excise tax was reduced from 4¢ per lb of contained copper to 2¢ per lb.

Zinc ores, concentrates and metal—The rate of duty on ores and concentrates was reduced from 1 1/5¢ to ¾¢ per lb of zinc content; and on slab zinc from 1 2/5¢ to ⅞¢ per lb.

Diamond dies—The rate of duty was reduced from 30 to 20 pct ad valorem.

Electrical apparatus—The rate of 25 pct which applied on a large part of all electrical goods has been reduced to 15 pct. Rates on telephone, diagnostic, and therapeutic apparatus (except X-ray) switchgear, fans and blow-

(CONTINUED ON PAGE 123)

Industrial Briefs . . .

• KEY TO BUSINESS PLANS—Francis Juraschek, manager of Commercial Research Div., Carnegie-Illinois Steel Corp. addressed the Pittsburgh chapter of ASM recently and called for progress in the development of market analyses to match technological progress. Steel, he said, needs to standardize products, sell selectively, and schedule replacements carefully.

• LARGE ORDER—Approximately 33,000 tons of steel will be fabricated into 32 miles of 68-in. welded pipe by Western Pipe & Steel Co., of Calif., for the East Bay Municipal Utility District of Oakland, Calif., for about $6 million.

• MORE TINPLATE DEMAND—Continental Can Co. has let a contract for construction of a 240,000 sq ft factory in Portland, Ore., at a cost in excess of $1 million.

• CHANGES NAME — The All American Industries, Inc., New York City, has changed its name to American Steel & Pump Corp.

• RYERSON EXPANDS—New offices and a large addition to the existing warehouse facilities in Cleveland, have recently been completed by Joseph T. Ryerson & Son, Inc., distributors of steel from stock.

• EXPORTS—The Borg-Warner International Corp., Chicago, has completed arrangements to handle the export activities of the Asbestos Mfg. Co., producers of automotive products.

• NEW MOTOR PLANT—A completely new plant for the manufacture of the Type U motor has just been put into operation by Bodine Electric Co. of Chicago.

• OPENS RETAIL STORE—The Air Reduction Sales Co. has opened a new retail store for the sale of welding products at Tenth & Cherry Sts. in Des Moines, Iowa.

• REPRESENTATIVE—Hunt - Jordan Co., Chicago, has been organized to handle exclusive representation for resistance welding equipment designed and produced by Progressive Welder Co., Detroit, in northern Illinois, including Chicago and part of Iowa and Indiana.

• MERGER—The I-T-E Circuit Breaker Co. of Philadelphia, announced the acquisition of the Railway & Industrial Engineering Co., of Greensburg, Pa., thereby uniting two prominent manufacturers of electrical switchgear equipment.

• NEW CORPORATION — Glynn-McKeon Corp., a newly formed corporation, has purchased the Elliott Foundry & Machine Works and Pneumatic Gate Works, both of Chicago. E. Kevin Glynn is president and James P. McKeon, vice-president.

• SOUTH AMERICAN AGENTS—Formation of the South American Minerals & Merchandise Corp. in New York, has been announced. They will represent a number of South American producers, importers and exporters for iron, steel and nonferrous products.

• WILL MOVE—Sperry Products, Inc., manufacturers of testing and measuring instruments, will move its manufacturing plant and general offices from Hoboken, N. J., to Danbury, Conn., during the summer of 1948.

• SILVER JUBILEE—The California Spring Co., Inc., Los Angeles, recently celebrated its twenty-fifth anniversary with an employees' picnic.

• METAL ROOFING PLANT—The Southern States Iron Roofing Co. has opened a new factory and warehouse at Raleigh, N. C. The firm, with home offices in Savannah, Ga., fabricates metal roofing.

Tool Builders

(CONTINUED FROM PAGE 118)

countries for inspection, crating or transporation. The possibilities of foreign buyers locating and obtaining such machine tools that fit their requirements is deemed practically nil. Further, at the 16 nation conference at Paris, preparatory to the Marshall Plan, import needs had nothing to say specifically about machine tools, but made mention only of productive equipment.

The Export-Import Bank, more interested in facilitating imports than exports, will assist in export financing on products whose sale will not have an inflationary effect on U. S. economy and will liquidate themselves through improvement of the purchasing country's basic productive plant. However, consummation of such negotiations is difficult because few important machine tool projects suitable for long term financing are developed by one manufacturer.

On short term transfer and credit insurance, the bank, while it has authority to work out such insurance selectivity for industries that warranted it, expressed no disposition to select any industry for an experiment. Further, they had no appropriations or staff to carry out the administrative work even if it were fully repaid by premiums.

The recently announced Multilateral Trade Agreement indicates cuts in tariffs on practically all machine tools and allied products coming into this country as well as into many other countries. British Empire preference, long a problem to American builders, has been somewhat modified but not yet abandoned. It isn't expected that these concessions will have much effect within the next few years on American machine tool exports, nor is the reduction in the United States tariff likely to bring many foreign machine tools into this country. It is expected that foreign machine tool industries will devote the greater part of their still limited capacities to competing with American manufacturers in markets where terms are more even and American producers don't have the advantage of close sales and service relationships with customers.

Weekly Gallup Polls . . .

Voters Oppose Use of U. S. Troops in Palestine Settlement

Princeton, N. J.

• • • **American voters** strongly favor the United Nations plan for dividing Palestine into separate Arab and Jewish states. At the same time they almost unanimously oppose use of United States troops to enforce proposed boundary lines, according to George Gallup, director, American Institute of Public Opinion.

Because England refuses to employ her troops for that purpose, it becomes important for top UN planners to know that if the American public has its way, the United States will likewise refuse.

Instead, voters feel some sort of a volunteer army under UN banners should be sent to the Holy Land when England's forces withdraw next August.

These opinions were revealed in a nationwide survey of representative voters just completed by the institute. To determine popular sentiment on partition, this question was asked:

"The UN has recommended that Palestine be divided into two states—one for the Arabs and one for the Jews—and that 150,000 Jews be permitted now to enter the Jewish state. Do you favor or oppose this idea?"

	Pct
Favor plan	65
Oppose plan	10
No opinion	25

Every section of the population gives substantial support to the proposal. Republicans and Democrats vote exactly the same. College trained voters are a little more inclined to favor the UN than are those with less education.

On the vital issue of what kind of troops are to be used to enforce settlement only 3 out of 100 voters think this nation should send any troops. The institute asked this question:

"If England pulls her troops out of Palestine and war breaks out between the Arabs and the Jews, do you think the U. S. should send troops to keep the peace or should this be done by a United Nations' volunteer army?"

	Pct
U. S. troops	3
UN army	65
Neither	18
No opinion	14

Should war break out between Arabs and Jews, only a third of voters now say they would be sympathetic toward either side. The vote of those expressing sympathy with one side or the other is two-to-one in favor of the Jews. This is shown by the following question and table:

"If war breaks out between the Arabs and the Jews in Palestine, which side would you sympathize with?"

	Pct
Jews	24
Arabs	12
Neither	38
No opinion	26

Whether a voter is pro-Jewish or pro-Arab only slightly influences his opposition to sending U. S. soldiers to enforce the peace. This is how those with expressed sympathies for one side or the other vote on that question:

	U. S. Troops Pct	UN Pct	Neither Pct	No opin. Pct
Pro-Arab	3	65	27	5
Pro-Jewish	6	80	9	5

In view of official Arabian opposition to the partition plan, it is interesting to note that almost six out of ten pro-Arab Americans favor the plan. The following table shows that correlation:

	Favor UN Plan Pct	Oppose Pct	No opin. Pct
Pro-Arab	58	26	16
Pro-Jewish	86	7	7

• • • **If American voters** had their way, all married couples in the country would be allowed to split their income in order to reduce their tax bills.

As things stand now only residents in 13 states and the Territory of Hawaii have this privilege. Thus federal income tax laws discriminate against citizens of 35 states having no such "community property" arrangement.

Observers in Washington now believe that a federal community property law is almost certain to be included in any legislation passed by Congress to grant tax relief. Recent institute polls show that the step would meet with overwhelming approval from voters throughout the country.

Husband and Wife Should Be Allowed to Share Income For Tax Purposes in All States

o o o

Last March when only eight states had community property provisions in their tax laws, and today, when five additional states have passed similar regulations, the institute asked this question:

"For purposes of income taxes, in 13 (eight) states a man and wife can divide their income equally between themselves to reduce their income tax. Should married couples in the other states be allowed to do the same?"

The replies:

	Yes Pct	No Pct	opin. No Pct
March 1947	74	10	16
Today	77	6	17

As would be expected the sections of the population presumably better off financially favor a nationally uniform ruling more strongly than those with smaller incomes. This is shown by the following table:

	For Federal Community Law Pct	Oppose Pct	No opin. Pct
Professional and business	84	7	9
White collar	81	7	12
Farmers	76	6	18
Manual workers	74	5	21

Because the issue involves incomes of married couples it is interesting to note that men are evidently more eager to have a federal law than women. Eighty pct of males favor the proposal and 75 pct of women.

The issue is one of those from which little or no political capital can be made because the fact that a voter is a Republican or Democrat makes very little difference in his opinion about community property tax laws.

An odd quirk is revealed by comparing the opinion of citizens who enjoy tax savings from split-income returns with those who do

(CONTINUED ON PAGE 136)

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

1100 Tons, Carrollton, Ky., Green River power station to Pittsburgh-Des Moines Steel Co., Pittsburgh.

1000 Tons, Orlando, Fla., power house for Orlando Utilities Commission, to Southern Steel Works Co., Birmingham, Robert & Co. Atlanta, engineers.

650 Tons, Armour, Fla., mill building for Armour Fertilizer Works, to Southern Steel Works Co., Birmingham, through Rust Engineering Co., Birmingham.

450 Tons, Chicago, addition to Central National Bank to Duffin Iron Works, Chicago.

350 Tons, Chicago, building for Peter Hand Brewing Co. to Bethlehem Steel Co., Bethlehem.

300 Tons, Chicago, plant for E. E. Mills Corp. to Wendnagle & Co., Chicago.

250 Tons, Chicago, building for the Henry Valve Co. to Reuter Iron Works.

240 Tons, Philadelphia, theater and store building, Frank H. Wilson, Ardmore, Pa., contractor, to American Bridge Co., Pittsburgh.

220 Tons, Gibbsboro, N. J., building for John Lucas Co., to Bethlehem Steel Co., Bethlehem.

210 Tons, Thayer County, Neb., bridge No. S35-3 State Highway Dept. to Omaha Steel Works, Omaha, Neb.

175 Tons, Whiting, Ind., plant addition for Federal Metals Co. to Reuter Iron Works.

165 Tons, Ord County, Neb., bridge No. S370-3 to Omaha Steel Works, Omaha, Neb.

100 Tons, Omaha, Neb., United Benefit Cafe through Peter Kiewit, contractor, to Gate City Iron Works, Omaha.

• • • **Fabricated steel inquiries** this week included the following:

4500 Tons, Clarks Hill, S. C., Clarks Hill Dam project through U. S. Engineers office. Bids closed Nov. 21.

2100 Tons, Antioch, Calif., buildings, E. I. du Pont de Nemours Co., bids in.

1600 Tons, Tracy, Calif., plate steel liner for discharge pipes, Tracy pumping plant, Bureau of Reclamation, Denver, Spec. 2007, bids to Dec. 12.

400 Tons, Harmarville, Pa., Gulf Oil Corp., bids in.

175 Tons, Perry County, Pa., structural steel for bridge, Pennsylvania Dept. of Highways, Dec. 19.

150 Tons, Philadelphia, Penrose Ave. bridge substructure, City of Philadelphia, Bids in.

• • • **Reinforcing bar awards** this week included the following:

480 Tons, Chicago, 21-story apartment building at 55th and the Lake to Peter Hamlin, general contractor.

130 Tons, Chicago, Dearborn St. subway project T9B, Leninger Construction Co. of Chicago, low bidder.

• • • **Reinforcing bar inquiries** this week included the following:

3050 Tons, Tracy, Calif., discharge pipes for Tracy pumping plant, Bureau of Reclamation, Denver, Spec. 2007, bids to Dec. 12.

3000 Tons, Clarks Hill, S. C., Clarks Hill Dam project through U. S. Engineers, bids closed Nov. 21.

1800 Tons, New Castle, Del., memorial bridge over Delaware River, contract No. 2, Dec. 17.

1000 Tons, Fort Wayne, Ind., U. S. Veterans' hospital. Bids close Dec. 19.

200 Tons, Boston-Chelsea, Mass., bridge for Mystic River Bridge Authority.

140 Tons, Grant and Douglas Counties, Wash., road construction on P.S.H. 10, Director of Highways, Olympia, bids to Dec. 2.

135 Tons, Davis County, Utah, two concrete bridges, U. S. 91, State Road Commission, Salt Lake City, bids to Dec. 1.

120 Tons, Chicago, St. Constantine Church. Bids closed Nov. 25.

• • • **Piling inquiries** this week included the following:

7300 Tons, States of Massachusetts and Rhode Island, bulk heads for various plants of Gulf Oil Co.

3400 Tons, Clarks Hill, S. C., Clarks Hill Da project through U. S. Engineers. Bi closed Nov. 21.

600 Tons, Boston-Chelsea, Mass., bridge f Mystic River Bridge Authority.

300 Tons, Duluth, dock through U. S. E gineers office in Duluth. Bids clo Dec. 4.

Coming Events

Dec. 1-3 Society of Automotive Engineers, air transport meeting, Kansas City.

Dec. 1-5 American Society of Mechanical Engineers, annual meeting, Atlantic City, N. J.

Dec. 1-6 Twenty-First Exposition of Chemical Industries, New York.

Dec. 4-6 Electric Furnace Steel Committee, AIME, annual conference, Pittsburgh.

Dec. 11-13 Electron Microscope Society of America, annual meeting, Philadelphia.

1948

Jan. 12-16 Society of Automotive Engineers, annual meeting, Detroit.

Jan. 12-16 National Materials Handling Exposition, Cleveland.

Jan. 19-20 Institute of Scrap Iron & Steel, Inc., annual convention, Chicago.

Jan. 21-24 American Society of Civil Engineers, annual meeting, New York.

Feb. 10-11 Pressed Metal Institute, annual meeting, Buffalo.

Feb. 15-19 American Institute of Mechanical Engineers, annual meeting, New York.

Mar. 3-5 Society of Automotive Engineers, national passenger car meeting, Detroit.

Mar. 18-19 Magnesium Assn., annual meeting, New York.

PMI Meeting

(CONTINUED FROM PAGE 116)

steel mills to accept and fill orde for hot rolled steel as in the pas refusal by certain steel mills to a cept and fill orders from old cu tomers located at considerable di tance from mills; refusal of certai steel mills to recognize the hi torical position of stampers wi companies absorbed by the ste mills, and lack of sufficient ingo rolling and pickling capacity.

Mr. Smith charged that th shortage of sheet and strip has r sulted in higher costs of stampin and end products using stamping

On behalf of the Pressed Met Institute, Mr. Smith proposed program calling for steel mills recognize the seriousness of th gray market and set up procedur that will, as far as possible, insu the use of steel by the purchas and in the event he cannot use t steel shipped, enter into an agre ment whereby he will sell it back the steel company at the purcha ing price. Other points in his pr gram are . . . that steel compani carry out in good faith the inform engagements entered into with go ernment authorities as a conditi for removal of government cont of steel distribution on a basis prewar history of purchases; th steel company-owned stampi companies be treated the same independent stampers in the allo tion of steel sheet and strip; th steel companies recognize the h torical position of stampers wi steel producers now absorbed them and allocate steel to the companies as though they were cu tomers of the present owni companies.

Mr. Smith also called for st producers to resume shipments hot rolled steel to those stampe having a historical position as its use and that allocation of st based on historical position made regardless of geographic cation of the customer.

He demanded that steel mills orders from stampers who have historical position with the co pany regardless of size.

Tariff Reductions To Permit Freer Flow Of U. S. Export Trading

(CONTINUED FROM PAGE 119)

ers were reduced from 35 to 17½ pct. The rate on washing machines and telegraph apparatus was bound at 17½ pct; the duty on X-ray apparatus and electric ranges was reduced from 17½ to 10 pct. The rate on a large class of machines which are dutiable only because they contain some more or less minor electrical feature was reduced from 27½ to 15 pct, to conform to a like reduction on the basic machines provided for elsewhere.

Textile machinery — The rates of duty applicable to this group of equipment have been reduced in most instances in the new trade agreement. The new rates range from 10 to 40 pct ad valorem, compared with the previous rates of 20 to 40 pct.

The agreement will be put into effect provisionally on Jan. 1, 1948, by Australia, the Belgium-Netherlands-Luxemburg Customs Union, Canada, France, the United Kingdom, and the United States, and by the other participating countries as soon as practicable. This must be done by June 30, 1948. Any nation may withdraw from the agreement, giving six months' notice, after Jan. 1, 1951.

Of equal importance with the tariff concessions are the general provisions of the agreement which establish for the first time a generally accepted international code of fair treatment in commercial relations.

Under these provisions, an unlimited most-favored-nation clause is incorporated. A blanket limitation on preferences, such as those maintained in the British Empire, is also included. These preferences may not be increased beyond levels in effect on a date prior to the agreement.

The duty on scrap was cut by the U. S. from 75¢ per ton to 37½¢ per ton. Extra duties for alloy content were reduced as follows: On vanadium content in excess of 1/10 of 1 pct from $1 per lb to 50¢ per lb, on tungsten content in excess of 2/10 of 1 pct from 72¢ per lb to 50¢ per lb, on chromium content in excess of 2/10 of 1 pct from 3¢ per lb to 1½¢ per lb. The 65¢ per lb extra for molybdenum content in excess of 2/10 of 1 pct was unchanged.

However, at the present time tariffs on scrap are in a state of suspension and, under present law, will not become effective until June 30, 1948.

Other major portions of the general provisions are as follows:

(1) Internal commodity taxes which apply to imported products must apply equally to like domestic problems; internal regulations in general may not treat imported products less favorably than domestic products; and any internal quotas or "mixing" regulations must not restrict imports to an extent greater than they did on Apr. 10, 1947, and must be subjected to negotiation for their further limitation or elimination.

(2) Special transit duties or other restrictions are prohibited and all regulations dealing with transit must be reasonable.

(3) Anti-dumping and countervailing duties are limited to specific purposes.

(4) "Actual" values must be used in assessing ad valorem duties. "Actual" value for customs purposes is defined.

(5) Non-discriminatory treatment in the application of requirements for the marking of imported products to indicate their origin is also included.

(6) With very rigidly defined exceptions, the use of quotas is prohibited.

(7) Balance-of-payments restrictions maintained at the time the general agreement comes into force must be gradually relaxed as the countries reserve position improves and must be completely eliminated when the reserve position would no longer justify their maintenance.

(8) The principle of non-discriminatory treatment is also extended to quantitative restrictions. It is required, first, that any restrictions applying to imports from or exports to, any party to the agreement, must also apply to imports from, or exports to, all other countries. Second, whenever restrictions are applied they should preferably take the form of published quotas, specifying the amount or value of the particular products involved which will be permitted to be imported during a specified future. Certain necessary exceptions are included.

(9) Countries may not circumvent the rules regarding quantitative restrictions by resorting to exchange controls having the same effect on trade.

(10) State trading must be conducted on a non-discriminatory basis.

(11) Tariff concessions may be modified after Jan. 1, 1951 by obtaining the agreement of the country with which the concession was initally negotiated.

A summary of some of the principal concessions granted by the various participating countries follows:

Australia:

Machinery and Appliances — Concessions were made on 45 tariff items under this group. In general, the primage duty of 4 pct on drilling machines, lathes, milling, planing, shaping and grinding machines, and other machine tools was eliminated leaving the rate of duty and preference at 15 pct. The duty and preference on tractors imported under by-law was bound at the existing rate of 10 pct and on others at 12½ pct.

Automotive Products — Concessions were made on 20 automobile classifications making reductions in duty ranging from 25 to 60 pct with corresponding reductions in the margin of preference. The reduction in the rate on chassis was not bound, but the reduction in the margin of preference was bound. The duty and preference on motorcycles were eliminated and this item placed on the free list. The duty and margin of preference on airplanes were reduced from 20 to 10 pct.

Electrical Equipment and Apparatus—Refrigerators and refrigerator parts make up the bulk of this group; the duty and preference on these items were reduced more than 25 pct.

Belgium-Luxemburg-Netherlands:

Automotive Products — The classifications established for automobiles and parts in the Customs Union tariff represent a marked improvement over the former tariff classifications, particularly over the old Belgian tariff. Ad volorem duties replace the former high Belgian specific rates based on weight, which favored European cars, chassis and parts. On airplanes free entry was assured for those to be used in international traffic and duties of 10 pct and 6 pct for other planes were bound against increase.

Machinery and Appliances — A large number of American machine tools which figure prominently in United States exports to the Benelux area were bound at 6 pct. Refrigerators were guaranteed against increases over the Customs Union rates of 6 pct and 12 pct. Similar low duties were bound for numerous other machines and appliances, including pumps of various kinds, prime movers, hydraulic and other presses, lifting, hoisting and road-building machinery, dynamos, and transformers. Various types of electrical apparatus were bound against increase.

Miscellaneous Products — Tinplate and certain types of iron or steel sheet and plate were bound at 3 pct and 4 pct. The duties on steel and aluminum furniture were bound against increase. Molybdenum was bound free.

Brazil:

Machinery and Vehicles — The duty on parts and attachments for earth-moving equipment has been cut by 60 pct. An 11 pct reduction was negotiated on physical apparatus for boats and vehicles, such as amperemeters, pressure gauges, thermostats, speedometers, etc., and 30 pct reductions were obtained on automobile chassis parts. Agricultural machinery and tools were bound on the free list.

Burma:

Metals, Metal Products, Machinery—The 25 pct rate on certain non-ferrous base metals was bound against increase. The duties on barbed wire and wire rope were bound at 20 pct. The 35 pct duty on hand pumps was reduced to 20 pct ad valorem.

Among the main United States exports to Burma, mining machinery other than for coal mining, oil crushing and refining, and pumping, had a 10 pct duty bound against increase. The duty on refrigerating machinery was reduced from 40 to 25 pct ad valorem.

Agricultural implements were assured continued duty-free treatment.

Canada:

Metals—Treatment accorded in preceding agreements was substantially continued; the relatively moderate rates which now stand on many types of industrial goods were bound.

An item to which special interest attaches from the viewpoint of imperial preference is tinplate, on which the Canadian government

will ask Parliament to eliminate the preference heretofore accorded the United Kingdom by applying a 15 pct rate to imports from that country which are now free and to reduce the 17½ pct rate assessed against the United States to 15 pct.

Automotive Products and Machinery—the important automotive schedule was unchanged, but the duties on aircraft and aircraft engines were reduced from 20 and 17½ pct, respectively, to 15 pct. Free entry was bound for most farm implements and machinery. Duties on engines and boilers, not including stripped automobile engines, were reduced from 25 to 20 pct. The rate on ore crushers and certain other mining machinery was reduced from 17½ to 15 pct and free entry was accorded locomotives and railway motor cars for mining, metallurgical and forest industries, when of a class not made in Canada.

Chile:

Metals—Moderate rates were bound on certain iron and steel bars, sheets, construction shapes, tinplate, bearings, screws and bolts, faucets, spigots and valves, and rails.

Machines and Vehicles—Reductions of over 90 pct of the duty were obtained on trucks, busses, jeeps, and handsaw blades; 75 pct on motorized trucks (warehouse type), automobile chassis; on tractors and on spare parts for vehicles the duty was reduced by about two-thirds; reductions of approximately 30 pct were obtained on machine saws, automatic refrigerators, and on most passenger automobiles.

China:

Automotive Products—The existing duty of 15 pct ad valorem on motor tractors, busses, trucks ever one metric ton carrying capacity, and chassis for any of the above was bound against increase. A reduction of 16⅔ pct was obtained in the duty on one ton trucks. In the case of passenger cars, chassis for passenger cars, and motorcycles, the present duty was bound. The duty on parts and accessories for motorcycles was reduced by 16⅔ pct, while the much lower duty on parts and accessories for motorcars and trucks was bound.

Machinery and Appliances—The present duty of 7½ pct ad valorem on agricultural machinery, machine tools, machine shop tools, and hand tools (wholly or chiefly of metal) was bound, as was the existing duty of 10 pct on pumping machinery, industrial refrigerating equipment, and "other machinery," a broad "basket" classification under which many types of heavy machinery have been imported.

Metal Products—In the category of metal products China bound present relatively low duties on aluminum foil, sheets, plates, castings, and moldings, on copper ingots and slabs, on a number of iron and steel products, such as billets, blooms, ingots, slabs, sheetbars, bamboo steel, and decorated and plain tinplate, and on certain enameled ironware.

Cuba:

Instruments, Machinery and Appliances—The rates on passenger cars valued at less than $2,300 at the factory were reduced from 16 to 26 pct while the existing rate was bound on automobiles valued at $2,300 or over. Reductions were secured of 50 pct on automobile bodies and truck bodies, unmounted, of about 20 pct on automotive parts and 33 pct on truck chassis. Duties were lowered substantially on motorcycles and parts, railway passenger coaches, and accessories for pumps and boilers. Moderate reductions were negotiated on many other items in this class, and bindings were granted on a number of low duty items such as agricultural machinery, electrical machinery and apparatus, and tractors and parts.

Miscellaneous Manufacturers — Among the concessions granted on iron and steel products were decreases on railway rails and rail bars of 16 pct, on rolled sheet, not polished or tinned, of 50 pct, and on wire over one-half millimeter and up to 8 millimeters in diameter, of 25 pct.

Czechoslovakia:

Automotive Products — Duty concessions were obtained from Czechoslovakia on heavy passenger automobiles and motorcycles, light trucks and on airplanes and airplane motors.

Machinery and Appliances—The moderate rates of duty on various machine tools were bound against increase.

France:

Automotive Products—The duty on automobiles was reduced from 60-65 pct ad valorem (plus quota restriction) to 35 pct ad valorem.

Machinery and Appliances — Duties were reduced from the following pre-war to the following agreement rates: Household refrigerators, 18 pct (plus quota restriction) to 15 pct ad valorem; hand tools from a range of 20 to 25 pct (plus quota restriction) to a range of 15 pct to 20 pct ad valorem; concessions were obtained on the following products; gear cutting machines, calculating machines, tractors, electric motors and industrial transformers, a wide range of machine tools and metal working machinery, various rough or worked machine parts of iron, steel or cast iron, various machine parts of two or several metals, various hand tools, and aircraft.

India and Pakistan:

Machinery—The existing 10 pct duties were bound on various types of machinery imports, including mining machinery, oil crushing and refining machinery, refrigerating machinery, petroleum and gas well drilling equipment, boot and shoe manufacturing machinery, sugar manufacturing and refining machinery, and metal working machinery, other than machine tools, and their parts.

On motor cars, chassis, parts, and accessories, the 9 pct margin of preference enjoyed by the United Kingdom is to be reduced to 6 pct when the agreement goes into effect, to 3 pct at the end of three years, and eliminated completely at the end of another three years.

New Zealand:

Motor Vehicles—The import duty on unassembled or completely knocked down motor vehicles was reduced from a total of 61¼ pct to 40 pct from 73½ pct to 50 pct. These reductions resulted in a decrease in the margin of preference from 56¼ pct and 49 pct to 35 pct and 30 pct, respectively. The margin of preference on motorcycles was bound at 10 pct.

Machinery—Concessions were made on a total of 10 machinery items. Reductions of more than 50 pct were made on tariff items covering engines for tractors, machinery for gold mining, boring and well drilling, machines and certain other classes of machinery.

Lesser reductions were made on the duty covering traction engines and tractors, machine tools peculiar to woodworking and metalworking and printing machines.

The duty of 3 pct on farm equipment was bound. The margin of preference was reduced on most of these items.

Norway:

Automotive Products—The duty on passenger cars was reduced from 50 pct ad valorem to 30 pct, while the rate on trucks was lowered from 24 pct to 20 pct, and the rate on aircraft from 24 pct to 12 pct. Parts for automobiles and aircraft were lowered from 40 to 25 pct. Tractors and parts were bound free.

Miscellaneous Materials and Products — Binding of present duty free treatment was obtained for tinplate.

Union of South Africa:

Automotive Products—Concessions on automobiles included the assurance that the specific duty on lower priced automobiles (now 23s. per 100 pounds) would not exceed 20 pct ad valorem; and the top price in this classification was increased from f.o.b. S.A. $1200 to $2400. The second classification of motor cars with f.o.b. S.A. value of $1600 to $2400 with a duty of 25 pct was increased from $2400 to $3200, while the third classification of f.o.b. value of $2400 at 30 pct was increased to f.o.b. value exceeding $3200. The existing rates of 5 pct and 3 pct on motor trucks were bound against increase. Parts and accessories for both automobiles and trucks were bound at 20 pct.

Machinery and Appliances — The duty and margin of preference was reduced from 5 pt to 3 pct on machinery for manufacturing and industrial purposes. The margin of preference of 7 pct on cranes, excavators, winches, etc., was eliminated, but the rate of duty was not bound. Agricultural machinery, fixed plant and machinery for factory installation, traction engines, stone crushers, road rollers and other road construction machinery and street sweeping and spraying machines were all bound on the free list. The duty on air conditioning and mining machinery was bound at the existing low rate of 5 pct.

Miscellaneous — The duty and margin of preference on barbed wire fencing was eliminated and this item placed on the free list.

United Kingdom:

Machinery and Appliances—The duties on most hand tools and tools usable with machine tools were reduced to or bound at 15 pct ad valorem, and the moderate rates on a wide range of machine tools were bound against increase. Portable pneumatic power tools were accorded a reduction of one-fourth. Imports of electrical cooking and heating apparatus were granted a reduction in duty of one-third to 10 pct ad valorem. Reductions of one-fourth were obtained on excavating and lifting machinery. The duty on rolling-mill machinery was reduced by approximately one-fourth, as was the rate on air and gas compressors and exhausters.

Under the category "motor vehicles," reductions were granted in the rate on motor bicycles and tricycles amounting to approximately one-third, the margin of preference being eliminated entirely. Duties for automobiles of 25 hp or more were bound at the existing rate. The rates on agricultural tractors were bound at the present rate of 15 pct ad valorem and the margin of preference was eliminated. The duties on imports of track-laying tractors were decreased by 25 pct in one case and 40 pct in another according to the drawbar horsepower.

Metals and Minerals—The duty and margin of preference on blast furnace pig iron smelted with coke was reduced by one-fourth, while the duty on aluminum sheets, strip, plates and discs was bound against increase.

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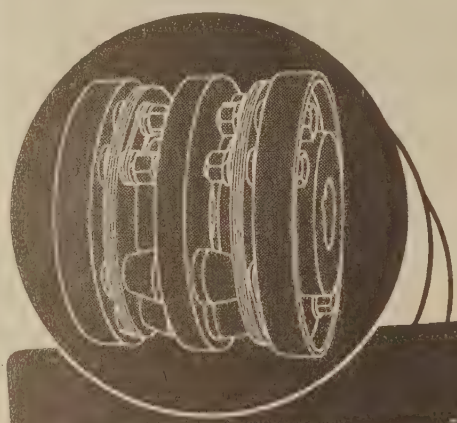

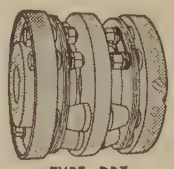
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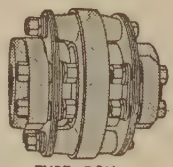
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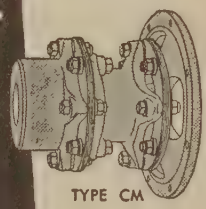
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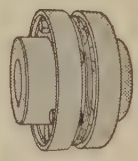
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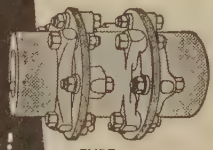
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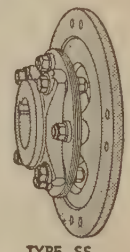
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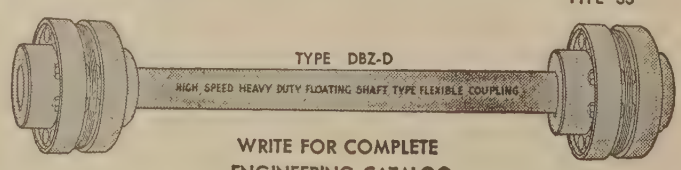

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Kaiser-Frazer Will Spend $600,000 For Sheet Steel Output

Detroit

• • • **Kaiser-Frazer** will spend $600,000 at its Indianapolis Rolling Mill Div. to increase sheet steel production for Kaiser-Frazer automobiles.

According to E. R. Ordway, general manager of the mill, the new program is designed to double the mill's capacity and to equip it to roll sheet of greater suitability and drawing quality for K-F auto bodies.

The general construction contract has been awarded to H. D. Tousley Co., Inc., of Indianapolis. The program includes a 140 ft extension to the south end of the main mill building and an 80 ft extension to the bar storage building. Structural steel will be supplied by the International Steel Corp., Evansville, Ind. Corrugated sheeting for the extensions will be fabricated in the K-F mill.

The Indianapolis expansion program includes purchase and installation of a normalizing furnace with a capacity of eight tons an hr and a box type annealing furnace. Other equipment will include pickling and scrubbing, roller levelers and oilers, a resquaring shear, a 25-ton bridge crane and a 10-ton crane for the bar storage building.

It is expected the new facilities will be installed without interrupting present production.

Construction Stays High

Washington

• • • **October construction** continued at about the September postwar peak, according to estimates by the Dept. of Labor. During October, $1.45 billion was spent for all types of building with a continuing gain in privately financed home construction. Expenditures for the first 10 months have now reached the $11.9 billion mark as compared with $9.5 billion for the same period in 1946. Industrial and commercial building totaled $2.2 billion for 10 months.

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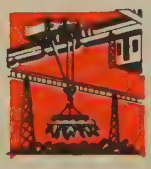

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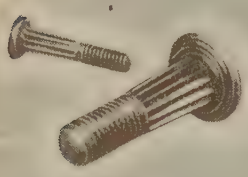
DARDELET RIVET-BOLTS with the locking thread . . . time savers for steel construction

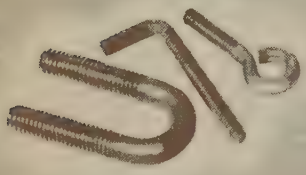


WEATHER-TIGHT Bolts—*modern* fasteners for wood assemblies—eliminate counterboring

PHILLIPS and CLUTCH RECESSED HEAD Machine Screws and Sheet Metal Screws

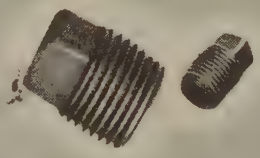
PLACE BOLTS—for locking assemblies rigidly

"1035" SET SCREWS of hi-tensile heat-treated steel, square head or headless

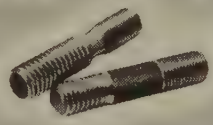


"BENT" Bolts, including U Bolts, J, L, Hook and Eye Bolts

WIRE ROPE CLIPS with the new Hi-Center Saddles and extra-strength U Bolts

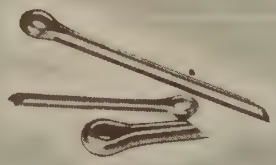


PIPE PLUGS, square head and headless; forged steel, heat-treated



LOK-THRED Studs and Pipe Plugs —Thread *locks* and *seals* in standard tapped holes

ROAD MACHINERY and other heavy equipment parts—high tensile and alloy fasteners



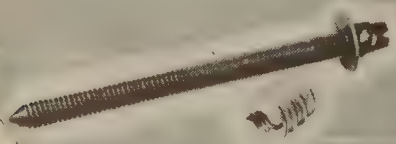
COTTER PINS of steel, brass, aluminum and stainless steel

BICYCLE PARTS, from axles and saddle bolts to chain-adjusting screws

PLASTIC INSERTS—made to your specifications . . . in production quantities

"BOLTS, NUTS & SCREWS"—a compilation of important technical articles on the manufacture, inspection, specification and use of fasteners; order from The Lamson & Sessions Co. at $1.00 per copy.

"BOLT, NUT & RIVET STANDARDS"—a complete and up-to-date standards book on commercial fasteners. *Available only* from the American Institute of Bolt, Nut & Rivet Manufacturers, Hanna Bldg., Cleveland, Ohio. $2.00 per copy.



FURNITURE BOLTS, Skein Nuts, Cabinet Bed Bolts and Bed Screws

AIRCRAFT PRODUCTS: AN Bolts, Nuts, Screws, Studs, Cotters (including Stainless Cotters)

• CARRIAGE BOLTS • MACHINE BOLTS • LAG SCREWS • WEATHER-TIGHT BOLTS • COTTER PINS • SEMS • KEY BOLTS • CHAIR and L
ONG NUTS • DARDELET RIVET BOLTS • CLIP BOLTS • PLOW BOLTS • TIRE BOLTS • SHEET METAL SCREWS • MACHINE SCREWS • STO
OR BOLTS • PHILLIPS SCREWS • CAP SCREWS • SET SCREWS • PIPE PLUGS • HOT PRESSED and COLD PUNCHED NUTS • SKEIN NUTS •
HEAD BOLTS • CLUTCH HEAD SCREWS • TAIL NUTS • HEEL BOLTS • ACORN NUTS • CAPPED NUTS • SLEIGH SHOE BOLTS • STOV
INS • CONNECTING-ROD BOLTS and NUTS • PLACE BOLTS • MARSDEN NUTS • SELF-TAPPING SCREWS • FITTING-UP BOLTS • U BOLTS •

a hard "hide"...

AND TOUGH CLEAN THROUGH!

LAMSON "1035" SET SCREWS

HERE'S THE *Big* DIFFERENCE

Ordinary Set Screws

HARD EXTERIOR — SOFT CORE — SOFT CORE MAY TWIST OFF UNDER HIGH TORQUE

Lamson "1035" Set Screws

HARD EXTERIOR — TOUGH CORE — SET SCREWS WON'T BREAK OFF WITH THIS TOUGH, HEAT TREATED CORE

YOU CAN'T JUDGE a set screw by its "skin" alone. You've got to get *below* the surface to determine real set screw quality.

Through a series of special heat treatments, Lamson "1035" Set Screws attain not only a high surface hardness but also a rugged toughness *all the way through.* This results in the ideal combination for a set screw: (1) outer hardness which provides a sharp "biting" surface at the point and (2) internal toughness that will withstand heavy compression and prevent heads or shanks from twisting off under high torque.

For the majority of set screw applications, Lamson "1035's" will perform as satisfactorily as the highest priced alloy product; yet THEY SELL FOR THE SAME PRICE AS COMMON, ORDINARY SET SCREWS.

Lamson "1035" Set Screws are available in a full range of commercial sizes.

So why not get premium quality without paying a premium price? Specify Lamson "1035" Set Screws for *double value:* a hard "hide" and toughness *all the way through!*

THE LAMSON & SESSIONS COMPANY

General Offices: 1971 West 85th Street • Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

SPECIAL PURPOSE Lamson+Sessions FASTENERS

NITURE BOLTS • SEMI-FINISHED NUTS • LAMSON LOCK ... JTS • ...
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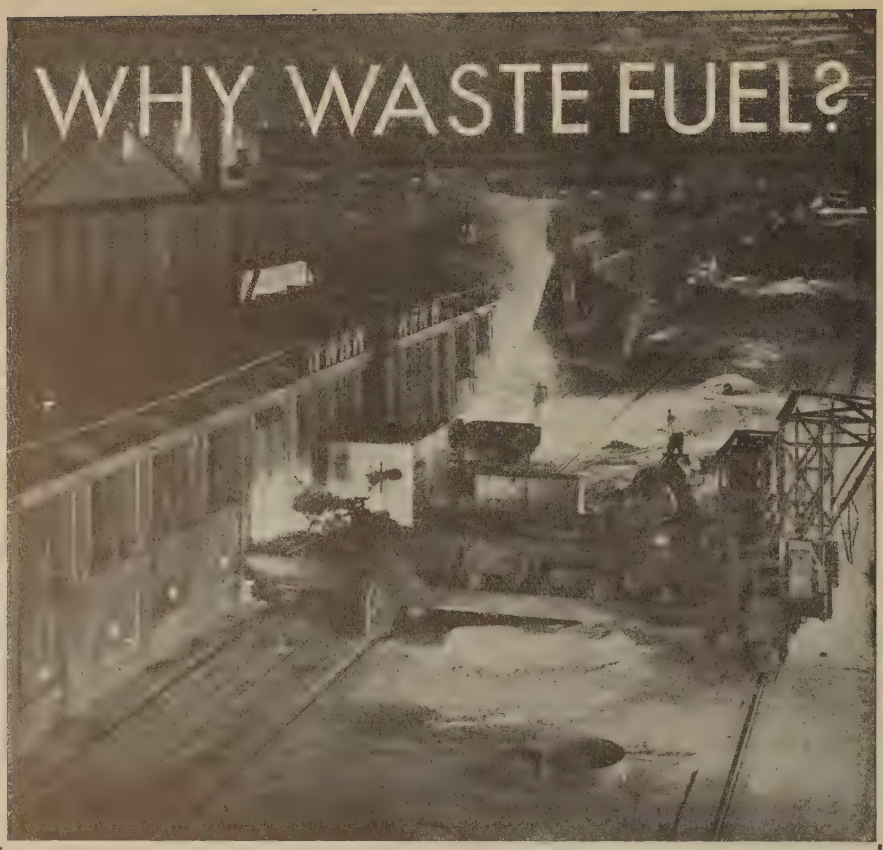
... • BARREL NUTS • OBLONG NUTS • CABINET BED BOLTS ... • WEATHER-TIGHT BOL...
STIC INSERTS • EYE BOLTS • CLEVIS PINS • HINGE PINS • ... ILLIPS SCREWS • CAP SCREWS • FIN HEAD BOLT...



Therm·O·flake *prevents waste*
BY REDUCING HEAT LOSSES...

MORE THAN 25% of Open Hearth fuel can be wasted through heat lost through brickwork and heat absorbed by cold infiltered air.

Therm·O·flake INSULATIONS are designed to reduce heat losses and seal furnace walls against cold air infiltration. These are used regularly on hundreds of open hearth furnaces and save steel producers thousands of fuel dollars daily.

Therm·O·flake ENGINEERS will prepare an accurate fuel economy survey of existing furnaces in your plant and submit complete thermal data and recommendations for safe maximum insulation of any open hearth furnace, on request.

Illinois Clay Products Company
JOLIET, ILLINOIS

Exclusive Manufacturers of
Therm·O·flake
open hearth Insulation

Iron and Steel Scrap Institute of New York Elects Its Officers

New York

• • • **Benjamin Schwartz,** of Benjamin Schwartz Co., New York, was re-elected president of the New York Chapter of the Institute of Scrap Iron & Steel at its annual meeting held recently in New York. Mr. Schwartz was formerly Director General of the Institute and during the war served in Washington as chief of the scrap metals section of Foreign Economic Administration.

George Alper, of Queensboro Structural Steel Co., was elected first vice-president, and Milton Levenson, of Miles Metal Corp., was elected second vice-president. Joseph A. Moskowitz, of Samuel Sons Iron & Steel Co., Inc., was re-elected chairman of the executive committee; Albert Raphael, of Bronx Iron & Metals Corp., was elected secretary, and Bertram D. Moskowitz, of Schiavone-Bonomo Corp., was elected treasurer.

Edwin C. Barringer, national executive secretary of the Institute, discussed the implications of the Marshall Plan in terms of scrap requirements.

The following were elected to the Executive Committee: William Frost, of P. W. Bowers & Co., Inc.; Charles J. King, of Charles J. King, Inc.; Harris Feistal, of Charles Dreifus Co.; William Hundt, of Luria Bros. & Co.; Robert Joseph, of Commercial Steel & Chemical Corp.; John Langan, of Continental Iron & Steel Co.; Richard Nathan, of Richard Nathan Co.; Hess Noch, of Luria Steel & Trading Corp.; Milton Weinstein, of Steel Scrap, Inc.; Fred Seligman, of Jakob & Seligman.

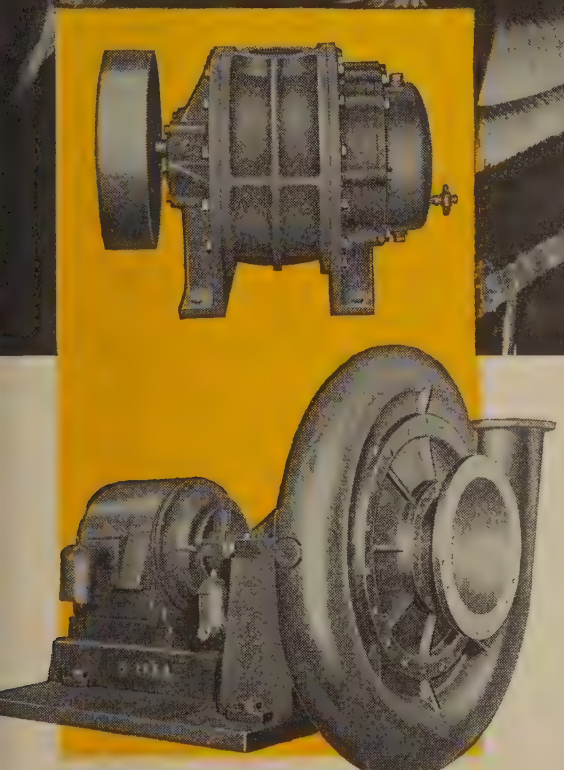
Austria Receives Credit

Washington

• • • **A fourth agreement** extending credit to a foreign country to be used in purchasing domestic war surpluses has been completed by WAA. The latest is in the amount of $10 million to be used by Austria and brings the total of such agreements to $67 million. All purchases under the agreements must be on a nonpriority basis and be confined to items in long supply domestically.

AIR GOES TO WORK FOR SAFER MINING

(Photograph by courtesy of Bituminous Coal Institute)



In 1858, when the Atlantic Cable carried its first message, "Roots" had been producing blowers for four years, since 1854. We're not good because we're old, but old because we're good!

Coal dust in mines is an old hazard problem. Modern practice minimizes danger by blowing rock dust onto walls and roofs, diluting the coal dust and safeguarding against explosions.

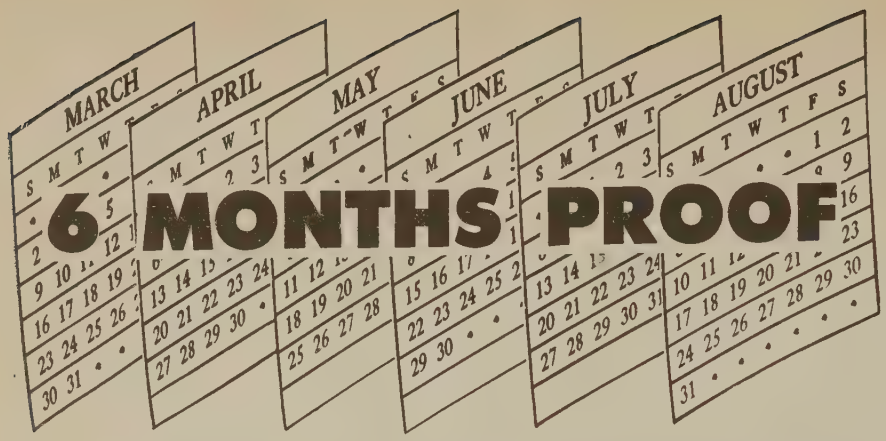
The installation pictured uses reliable Roots-Connersville *Rotary Positive* Blowers. These compact, sturdy units have a capacity for long, hard work that especially suits them to such unfavorable conditions.

For many applications, the advanced designs of R-C *Centrifugal* Blowers are more advantageous. Whatever the work to be done, our *dual-ability* to design and build both types enables us to recommend the *right* blower for the specific job.

So, if you have a problem of handling gas or air in any quantity, ask R-C *dual-ability* to help solve it.

ROOTS-CONNERSVILLE BLOWER CORPORATION
711 Ohio Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
ROTARY CENTRIFUGAL
BLOWER BUILDERS R-C SINCE 1854
BLOWERS • EXHAUSTERS • BOOSTERS • LIQUID AND VACUUM PUMPS • METERS • INERT GAS GENERATORS
★ ★ ONE OF THE DRESSER INDUSTRIES ★ ★



THE *NEW* SIEFEN BUFFING NU-SPRA-GLU IS *NOW BETTER THAN EVER . . . !*

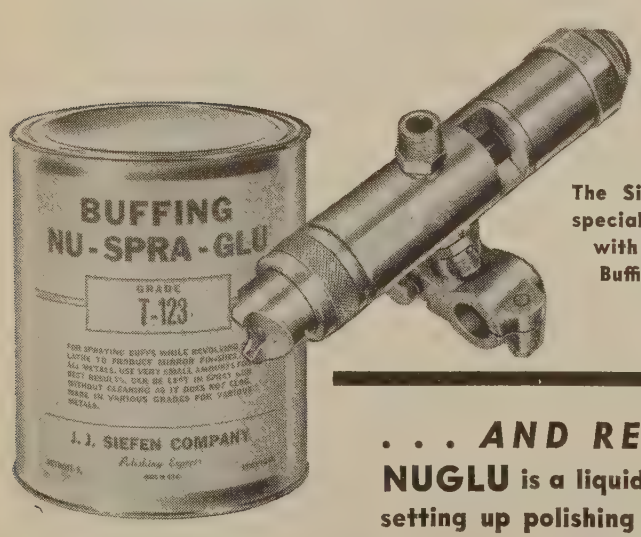
This liquid buffing compound . . .

★ DOES NOT CAUSE FIRES

★ DOES NOT CLOG SPRAY GUN

★ BETTER CUT ★ BETTER COLOR

★ In March, 1947, the J. J. Siefen Company introduced their *NEW* BUFFING NU-SPRA-GLU and six months exhaustive tests have proven that this new compound is better and safer in every way. For the best possible buffing job, the new compound should be used in Siefen made spray guns. The Siefen gun was designed specially to spray compounds and its use in conjunction with *NEW* BUFFING NU-SPRA-GLU assures continuous production with fewest work stoppages.



NEW

The Siefen spray gun is specially designed for use with the *NEW* Siefen Buffing Nu-Spra-Glu.

. . . *AND REMEMBER*
NUGLU is a liquid cold glue for setting up polishing wheels.

J. J. SIEFEN COMPANY
5629 LAUDERDALE • DETROT 9, MICH.

Studebaker Purchase Of $3.5 Million WAA War Plant Approved

Washington

• • • **Studebaker Corp.** this week was a step closer to ownership of the government's surplus $3½ million South Bend, Ind., plant with approval of the sale by War Assets Administration.

The sale now is subject to National Security Clause restrictions which provide that the plant shall be returnable to the government within a specified time period in its former production condition in event of a national emergency.

Studebaker produced aircraft engines as wartime operator of the plant. In addition to security restrictions, the engine test buildings and equipment are to be maintained for 5 years, in accordance with Munitions Board regulations. The sale also is subject to approval by the Justice Dept.

Studebaker plans to use the plant for manufacture of trucks and automobiles. The firm is to pay 20 pct cash on closing and the balance in 10 years in quarterly payments with 4 pct interest. The company may pay the entire purchase price at the time of acceptance of title.

Urges Management, Labor Settle Own Differences

Chicago

• • • **"Sound industrial** relations for the job ahead" was the theme chosen for the 48th annual convention of the National Metal Trades Assn., which was held in Chicago. Robert N. Denham, general counsel, National Labor Relations Board, delivered the keynote address to the assembly. His topic, "Labor-Management Relations Act Meaning and Application," proved to be an interesting explanation of the new functions of NLRB and how they affect industrial relations.

Mr. Denham said, "While the Taft-Hartley Act brings into play something which employers have been seeking for a long time in the form of machinery for equalizing the responsibility and relations between employers and labor organizations, by providing standards of conduct for both, violations of which can be made the

This 30 second comparison test may boost your profits

Faced by today's narrowing profit margin, alert fabricators are reviewing and revising their specifications for cold rolled strip steel. Increasing numbers are finding that the extra values built into CMP Thinsteel strip can materially help to meet the challenging demands of both product quality and production efficiency.

USUAL STRIP STEEL	CMP THINSTEEL	
	✓	Unvarying coil-after-coil dimensional accuracy, physical properties and chemistry.
	✓	Wide range of physicals and analyses—tailored to your job.
	✓	Extra long coils—for less down time, more efficient production.
	✓	Gauges thin as .001"—for lightness with strength.
	✓	Superior surface finish that cuts finishing costs.
	✓	The product of a specialist—for CMP produces *only* cold rolled strip steel.

This 30 second comparison makes apparent only the general advantages of CMP Thinsteel. A detailed comparison, related to your specific applications and production operations, may bring to light many other CMP Thinsteel advantages.

THINSTEEL

CMP PRECISION COLD ROLLED STRIP STEEL

GIVES MAXIMUM PRODUCTION PER TON

THE COLD METAL PRODUCTS CO.

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Grinding operations are easy when you use a Stearns Grinder Holding Magnet. Grips your material securely, safely, efficiently —a very flexible job that will cut your costs. Saves time of chucking up, makeshift jigs and clamping devices. Ask for information on the Stearns Grinder Holding Magnet. Readily installed with low initial and maintenance cost.

Also—Stearns Magnetic Pulleys, Drums, Separators. Widely used for sand treatment, reclaiming of metals. Stearns Lifting Magnets for moving material.

Separators
Drums - Pulleys
Clutches - Brakes
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Stearns MAGNETIC MFG. CO.

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subject of unfair labor practice charges, that this is not the panacea to cure the ills of industrial relations. It may be a vehicle, but no more. Industrial relations are human relations and all the legislation in the world is not going to write a single labor contract that will fix and stabilize the relations of an employer and his employee.

"Rushing to the NLRB every time the union does something which seems to be obnoxious may provide a degree of satisfaction, but it too often will only provide an additional irritant. Sitting around a conference table and thrashing a matter out in a collective bargaining conference will do more to settle those things and leave a better taste in everybody's mouth than all the litigation you can ever conduct before the board."

British Allocation Of Cupola Coke For Foundries Announced

London

• • • **It has been agreed** that the ironfounding industry shall receive allocations for all foundries (whether engineering, tied foundries or foundries manufacturing purely for resale) of sufficient cupola coke to make 3 million tons of castings annually.

The disposition of the allocations for the manufacture of this quantity of castings will rest with the Iron and Steel Board. It may be that some firms engaged on non-priority work will find themselves not as favorably placed as others who are engaged solely on export or work high up on the priority list. But due consideration will be given to the claims of manufacturers of repetition castings for the priority industries, and particularly those of firms operating with new methods which are conserving labor to a marked degree. It is the intention of the government to maintain the allocations of coke supplies to the foundries as far as possible this winter, even to the detriment of the domestic consumer.

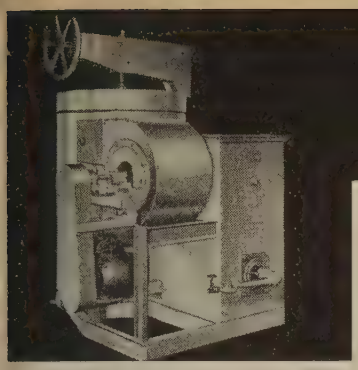
With regard to coal supplies a different line has been taken with ironfoundries than was originally expected. Concerning engineering works having attached foundries, it has been found impossible to make their coal allocation through

Sunbeam

STEWART

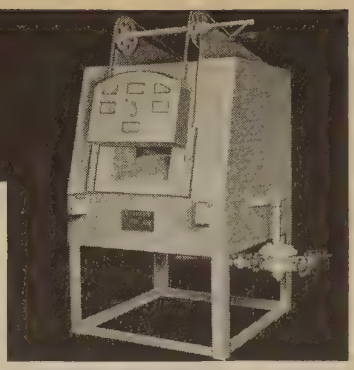
There is a Sunbeam Stewart Industrial Furnace for Every Need

Forging • Carburizing • Case Hardening • Tinning • Normalizing • Brazing • Rod Heating • Lead Hardening • Billet Heating • Oil Tempering • Plate and Angle Heating • Soft Metal Melting • Hardening High Speed Steel • Galvanizing • Stress Relieving • Rivet Heating • Brass Melting • Annealing • Salt Bath Hardening • Cyanide Hardening • Hardening Carbon Steel



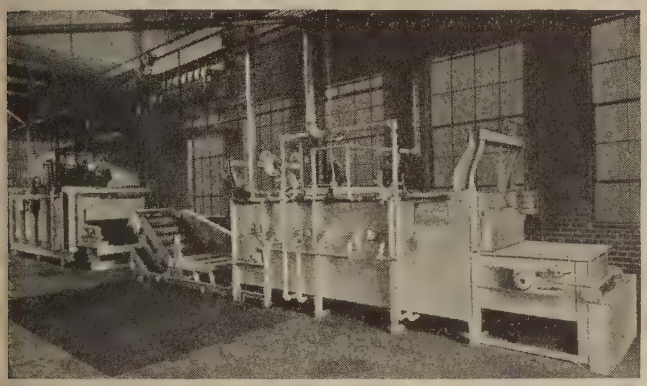
BASKET RECIRCULATING FURNACE

Small tools, dies, or anything small enough to be most conviently handled in batches, can be easily tempered or stressed relieved quickly and uniformly in this Sunbeam Stewart unit.



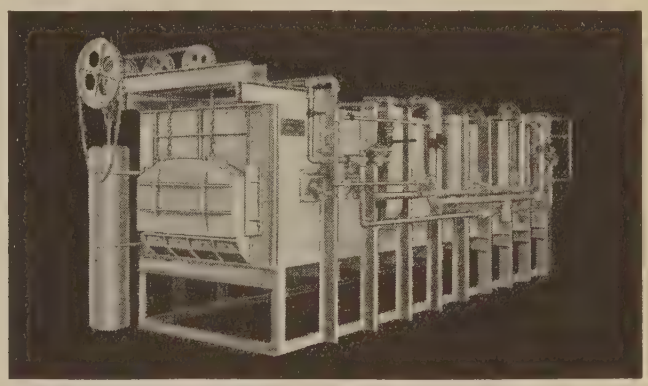
SEMI-MUFFLE AND FULL-MUFFLE OVENS

Where special atmospheres are required, Sunbeam Stewart Semi-muffle and Full-muffle Furnaces (with patented seal-tite door) are recommended.



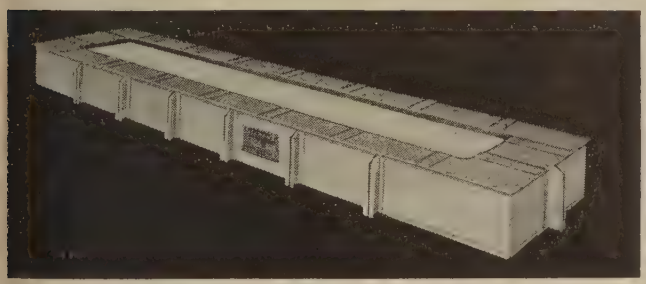
HARDENING, QUENCHING AND DRAWING UNIT

A representative Sunbeam Stewart automatically controlled continuous conveyor type hardening, quenching and drawing installation. Has automatic temperature control, wide operating range, variable production capacity and automatic handling through all operations.



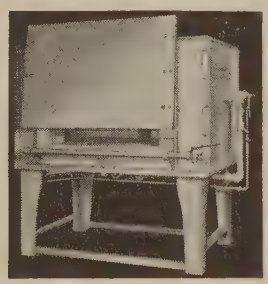
HEAVY PORTABLE OVEN FURNACE

Rugged, heavy-duty casing, lining and insulation, combined with the carefully engineered combustion, atmosphere and temperature control make Sunbeam Stewart Heavy Portable Oven Furnaces outstanding in production and uniform results. Available in under-fired semi-muffle, or over-fired construction.



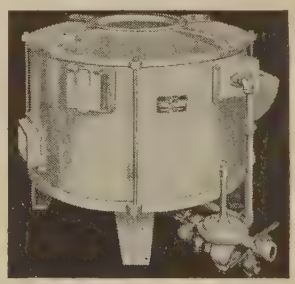
GALVANIZING FURNACE

Typical of the many installations Sunbeam Stewart has engineered for galvanizing wire, sheet, hollow-ware, tanks, pipe fittings, plumbing fixtures, etc. Features of these settings are the long pot life, low dross loss, and high production made possible by the Sunbeam Stewart principle of "high-firing" with baffle protection for pot.



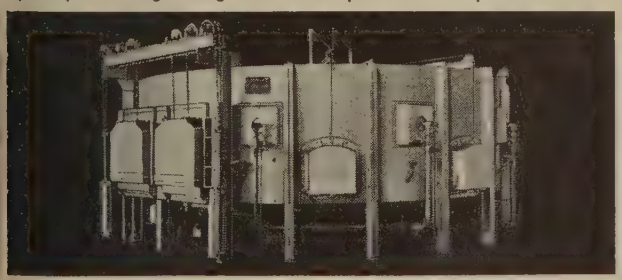
OPEN SLOT FORGE

Designed for drop hammer work or similar operations requiring a continuous feed of heated work. Also especially suitable for end heats. Design of heat shield and air blast provides maximum of comfort for operator.



ROUND POT FURNACES

Such processes as lead, cyanide, and salt bath hardening, oil or salt tempering are carried out in thousands of these versatile units. Easy temperature control, uniformity of temperature, and long pot life are features of this unit.



ROTARY HEARTH FORGE

Circular tunnel-type rotary hearth is sand-sealed and friction driven at three points. Engineered to meet large heavy-duty production requirements, this installation guarantees the thorough even heat good forging and piercing practice requires.

FREE

"Guide to Furnace Selection"

Has the answer to the type of gas or oil-fired furnace best suited for your requirements. Write Sunbeam Stewart Dept. 110 for this handy furnace guide today.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(*Formerly* CHICAGO FLEXIBLE SHAFT CO.)

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Canadian Factory: 321 Weston Rd., S., Toronto 9

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

the Iron and Steel Board, as this would have meant the Iron and Steel Board being responsible for the coal allocation for their engineering works as well. Sponsorship for the allocations of coal supplies will have to be obtained from the government departments dealing with the finished products, and not through the Iron and Steel Board. The amount of fuel available for this purpose, therefore, will be that allocated to the "finishing" industries, and will include the foundry.

The demarcation line which has been drawn for the purpose of determining the allocation of coal in this instance has been that of a 50 pct margin of production. Firms manufacturing over 50 pct of castings for use in their own processes or finished manufactures will come within this category, and will have to obtain their coal supplies through other departments than the Iron and Steel Board. The malleable ironfounding section is still being included in the Iron and Steel Board's allocation.

British Steel Output Running 10 Pct Above Last Year's Tonnage

London

• • • **British steel** production after a record annual rate of 14.24 million long tons in the week ending Oct. 4, was 14.14 million long tons in the succeeding week and 14.22 million long tons for the week of Oct. 18. The industry's output per man in September and October has been running a little over 10 pct above last year, and higher than the 1938 rate.

The 1948 target of 14 million long tons is within the theoretical capacity of the industry, but its achievement depends on the availability of fuel, labor and raw materials, and it may be affected by transportation difficulties. Sir Stafford Cripps, Minister for Economic Affairs, speaking at a press conference on Oct. 29, said that every effort would be made in the coming winter to give the industry its full requirements of coal and coke, and that these fuels had been allocated on the basis of 100 pct requirements. In regard to labor, the industry, according to the Minister, is in better shape than many other basic and export industries. Only the tinplate section is undermanned.

It is in the future availability of raw materials that the danger lies. Supplies of pig iron and scrap from production and import have been below consumption level in 1946 and, except during the fuel crisis, in 1947. Consequently there has been considerable drawing on stocks of pig iron and scrap, and production of both must improve if the steel industry is to maintain its advance.

Sir Stafford Cripps emphasized this need for scrap. Without an adequate supply of scrap—and this he asked all manufacturers particularly to note—Britain would not have enough steel for her export requirements. Good salvage arrangements in every works were an essential factor in the success of the export drive, he said. Questioned as to sources of scrap, Sir Stafford Cripps said it was hoped to get one million tons from Germany. This would not be in the form of plants broken up on the reparations account.

Weekly Gallup Polls

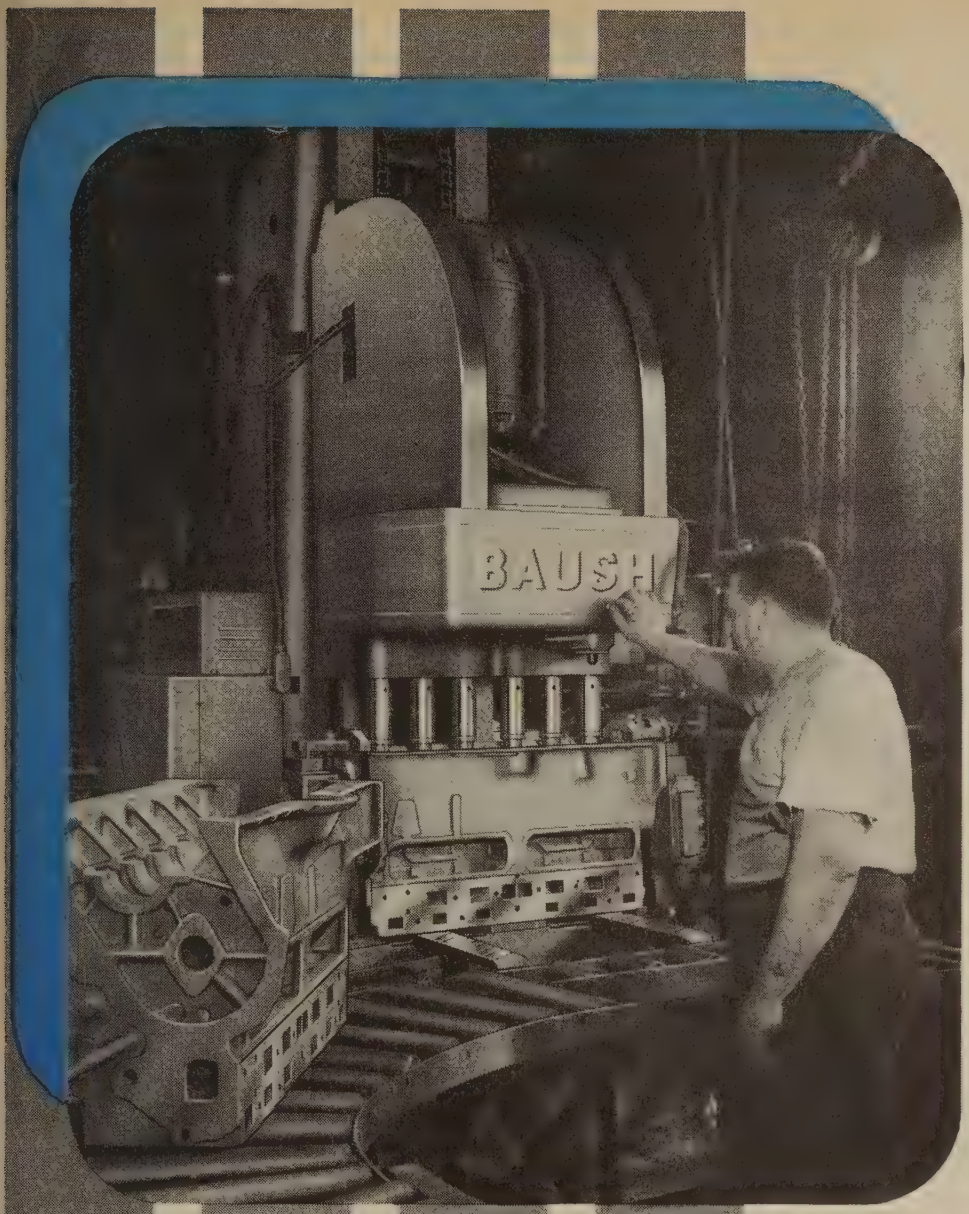
(CONTINUED FROM PAGE 121)

not. Residents of the 13 community-property states give a slightly higher vote to spreading the tax savings to the rest of the nation than those who do not have the privilege.

Official estimates, based on split income tax returns, place the approximate annual revenue loss to the federal government at $600 million were the community property law to become applicable to all 48 states. Only married couples with more than $3300 income would benefit.

Eight states whose laws derive from early Spanish and French laws have long had community property provisions; those states are: California, Nevada, Texas, Louisiana, New Mexico, Arizona, Idaho, and Washington.

Five other states have passed laws to give their citizens the same benefit; they are: Oklahoma, Oregon, Nebraska, Pennsylvania, and Michigan.



reduces machining costs on automotive cylinder blocks

This Baush Vertical W-6 Hydraulic Multi-Spindle Machine Tool—shown in action at plant of a large heavy-duty engine manufacturer—is just one of many types of single-purpose, multi-operation machines designed and built by Baush to reduce production machining costs.

Baush ingenuity and "know-how" in machine tool design has enabled many outstanding engine makers to meet the challenge of today's demands for lower production costs. Send us your problems. With over 50 years of experience in this field we know we can help to lower your machining costs.

Part — Automotive Cylinder Block
Operations — Removing excess stock from main bearing ribs, essential for hone clearance, and chamfering the bottom of cylinder bores.

specifications:

Baush Vertical W-6 Hydraulic Multi-Spindle Machine. Cast-iron bed, column and head saddle. Hydraulic pump and cylinder — 18″ maximum stroke.
Fixed center head furnished with (6) heavy-duty stub nose spindles.
Head furnished with special device for positioning of spindles.
Spindles driven by 10 H.P. main motor and hydraulic pump powered by 2 H.P. motor.

fixture:

Part loaded into stationary fixture resting on top surface. Cylinder block is slid off conveyor onto loading rails and pushed by hand into fixture to a temporary position. Six lower pilot bushings are raised into cylinder bores. The two end pilot bushing stools locate in cylinder bores. The other four have clearance. Block is clamped by a planer type clamp on each end.

BAUSH
MACHINE TOOL CO.
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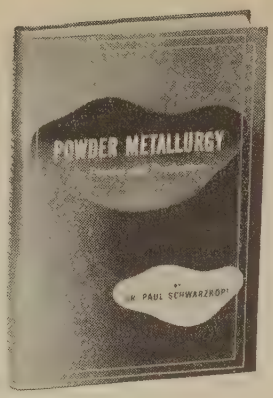

This book clearly and completely explains the present capacities and future potentialities of powder metallurgy.

Written by a pioneer powder metallurgist who holds hundreds of the basic patents and has spent 30 years in the highly successful development of this new science, this book

- covers all aspects of the subject: the industrial processes, machinery and techniques; the products obtainable from each metal and alloy, the special processes used for each, and the particular problems involved in each; all under lying theory.
- reveals many production details seldom available on a developing technology, since the author has no restrictions on the disposal of his very extensive knowledge and experience.
- is completely up-to-date, covering the war and postwar developments and all the latest work in the field, much of it still unpublished.

Write us today for an on-approval copy of POWDER METALLURGY by Dr. Paul Schwarzkopf and his associates ($8.), and see for yourself how profitable this book will be to you.

THE MACMILLAN COMPANY, 60 FIFTH AVENUE, NEW YORK 11

What can be done with COLD FORGING and supplemental operations?

ASK MILFORD!

EXAMPLE: Small part formerly screw-machined

MILFORD COLD FORGING SAVED 161 LBS. OF BRASS PER 1000 PIECES!

Eye-opener savings! As high as 67% not uncommon. 25% to 40% an every day occurrence. Milford equipment for cold-heading — and experience — are unsurpassed; have cut costs for others, can cut costs for you.

Since many parts now screw machined can be cold-headed, why not investigate? First step: send sample part or fastener. Milford engineers will carry on from there. No obligation.

THE MILFORD RIVET & MACHINE CO.

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Members of Ore Assn. Urged to Make Survey To Locate More Scrap

Cleveland

• • • **Donald B. Gillies, president,** Lake Superior Iron Ore Assn. and a vice-president of Republic Steel Corp., has asked the members of the Association to make a careful survey at all their mines and properties to uncover idle and obsolete equipment which can be consigned to the scrap heap.

In a letter to Association members, Mr. Gillies urged that the scrap survey be made as a means of "avoiding a disastrous drop in steel output in the forthcoming months."

Mr. Gillies' letter stated that Julius A. Krug, Secretary of the Interior, had recently written the Association stressing the great importance to the national economy of turning in scrap to avoid a drop in steel production and the resulting distress it would bring to industries using iron and steel products.

"Mr. Krug pointed out the likelihood that in and around mines and quarries there is machinery and equipment which has been scrapped or is waiting to be scrapped and urges that this material be directed into consuming channels as soon as possible.

"Mr. Krug's request can hardly receive too much attention from the members of this Association The situation is truly a critical one. Every effort is being made to move scrap obtained from automobiles, buildings and other sources, and railroads are returning scrap at a higher rate. It is believed that scrap accumulations from farms and homes have been largely exhausted although small quantities continue to be collected."

Wages Up; So Are Costs

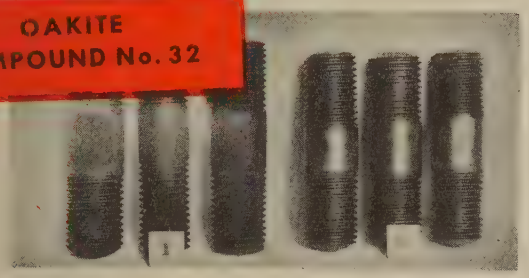
Washington

• • • **Manufacturing wage rates** have increased 31 pct since VJ-Day and 11 pct since a year ago, according to the Bureau of Labor Statistics, which points out that the cost of living has advanced about 24 pct over wartime levels. Actual weekly earnings, however, are up only 21 pct for the postwar period, largely because of shorter hours and shifting from wartime industries, BLS said.

Corrosion is electrolytic action which causes ferrous metals to break down into oxides known as rust. The cost to you and industry? Almost six billion dollars a year. But with the Oakite anti-rust program you can . . .

Cut your rust costs 3 ways

OAKITE COMPOUND No. 32

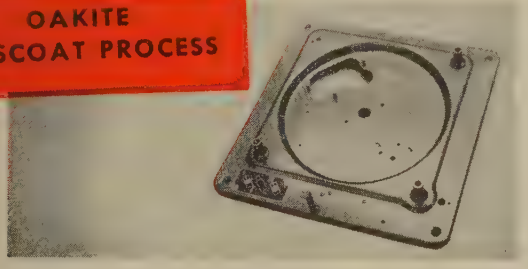


Rust-covered bolts, at left, shown clean and derusted at right, after Oakite derusting treatment.

OAKITE SPECIAL PROTECTIVE OIL

Forged and machined stock, spray-coated for in-storage protection against rust.

OAKITE CRYSCOAT PROCESS



Record-changer bases are CrysCoated before painting for anti-rust protection.

OAKITE methods and materials for combating rust are sure in action, low in cost. Used as directed, Oakite Compound No. 32, an inhibited acidic material, removes rust and scale without brushing or scraping . . . without harming metal. Merely immerse parts, then neutralize and rinse—rust is gone.

To prevent indoor rust on work in process, parts or assemblies in storage or in transit, use Oakite Special Protective Oil. Leaves a semi-permanent, thin oil film which provides adequate protection against corrosion. Applied by dip tank, spray or brush, Oakite Special Protective Oil displaces moisture on metal surfaces; drains and dries quickly. Easy to remove. Economical because thin film covers large areas . . . has high dilution ratio.

Ferrous parts ready for painting may be rust-protected by means of the Oakite CrysCoat Process. Applied in machine or tank, this widely used pre-paint treatment not only retards under-coat corrosion, but cleans and phosphatizes metal for tight paint grippage. Also localizes corrosion if paint is scratched.

Write Today for detailed facts about the Oakite 3-way anti-rust program. No obligation.

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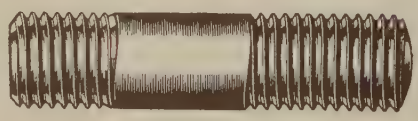
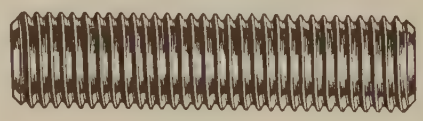
Tap end studs are threaded for steam fit on tap end; on nut end, A.N. Coarse thread—Classes 2, 3, or 7 fits. Double end and Continuous threaded studs are threaded Classes 2, 3, or 7 fits, unless otherwise specified. Diameters from ½" to 2½". Lengths to suit.



● TAP END STUD

● DOUBLE END STUD



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Steel Rolling Mill At Vancouver Will Begin in February

Vancouver

• • • **Mr. Leslie H. Eyres** announced recently that a new Provincial Co. has been incorporated and will be known as the Vancouver Rolling Mills, Ltd.

The new company has acquired 12 acres on South Marine Drive about a block and a half west of Fraser Ave., and a building 300 ft long x 60 ft wide has been erected, with a spur track 800 ft long running alongside the length of the building and connecting with the Vancouver and Lulu Island Railway.

This company is now erecting a steel rolling mill in Vancouver to manufacture and roll steel rods and shapes from steel scrap.

Concrete foundations for the mill have been laid and a 12-in. 6-strand rolling mill has just been installed. A 500 hp motor, which will drive the mill, has arrived from the east. At the moment the company is installing a hot bed 100 ft long, which should be completed within the next few weeks.

The production capacity of this 12-in. mill is over 20,000 tons per year and the mill is capable of rolling rods from ⅜ in. diam to 1¾ in. diam, both in rounds and squares. It is capable of manufacturing small angles, channels, eyebeams, reinforcing steel and light rails, and should largely help to alleviate the steel situation in British Columbia in the near future.

The group who have financed and will be operating this company will be as follows: Ronald L. Cliff, president; C. D. Hobbs, managing director; Scott Keenlyside, secretary-treasurer; and Leon J. Ladner, director and legal counsel.

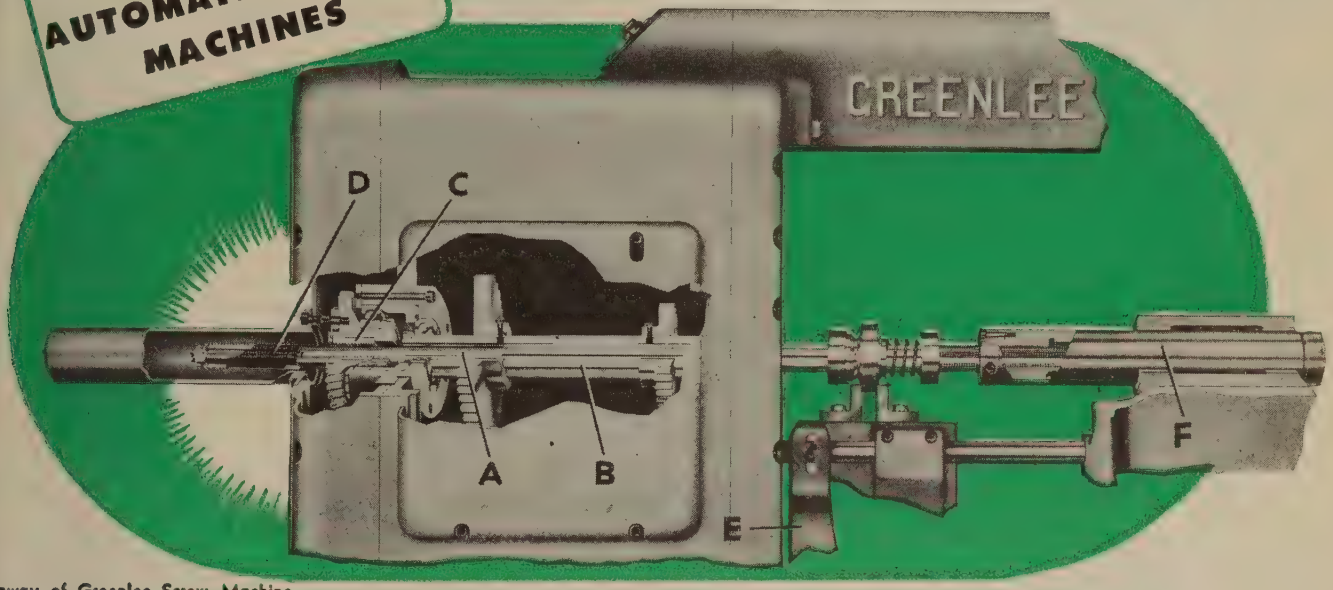
Buys WAA Surplus Plant

Washington

• • • **Hanchett Manufacturing Co.** has bought a surplus machine tool plant at Big Rapids, Mich., from War Assets Administration for $95,955. Hanchett operated the plant—built in 1942 at a cost of $170,631—during the war. Included on the 1-acre site are a concrete and brick building and seven cranes.

New LEAD-SCREW FEED ON GREENLEE AUTOMATIC SCREW MACHINES

Speeds Production OF PRECISION-THREADED PARTS



Cut-away of Greenlee Screw Machine showing combination cam-and-lead-screw-operated threading spindle in 5th position

NO SPECIAL CAMS OR SPEED GEARS REQUIRED — SIMPLE DESIGN SAVES TIME AND MONEY . . .

Here at last is a screw machine development offering an economical solution to the problem of cutting precision threads at production speeds. This new cam-and-lead-screw-operated threading arrangement for the Greenlee "6" gives a rapid approach, accurate threading-in and threading-out, and a quick withdrawal. It speeds production and insures a uniform, high-quality thread with a very accurate lead.

As illustrated, the Threading Spindle Drive Shaft "A", which is driven by Splined Sleeve "B", is relieved of splines at its outer end. Driven at a constant speed, bronze Lead-Screw Nut "C" engages precision Lead Screw "D" to produce the necessary lead. Cam-operated Lever "E" handles the rapid approach and quick withdrawal. Precise adjustments for depth are made by setting Spindle "F" on the threaded Drive Shaft "A".

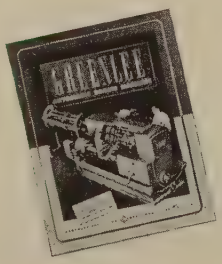
7 Cost-Saving Features

- Cuts costs of producing parts requiring precision threads.
- Positive lead-screw feed insures uniform high-quality results.
- Reduces scrap losses.
- Simple design plus interchangeable feature cuts equipment and re-tooling costs.
- Increases work handling capacity.
- Quick and easy adjustments save set-up time.
- Easily adapted to old machines at nominal cost.

Economical To Use — Completely Interchangeable

To cut threads with different taps or chasers, it is only necessary to change the easily-removed lead screw and nut. Lead screws and nuts with different leads can be made to order in your own tool room and are easy to store. Thus, a wide variety of work can be handled, quickly and economically. Lead-screw threading operations can be handled in 3rd, 4th, and 5th positions. *In addition,* by simply removing the lead screw and nut, the Greenlee "6" can be quickly changed-over to handle ordinary jobs. No special cams or speed gears are required.

GREENLEE



WRITE FOR DETAILS TODAY

Get facts on how you can speed up production, reduce scrap losses, and increase your work handling capacity with a Greenlee "6". Conversion parts are available for all Greenlee Sixes now in use. To avoid delays, write now for full details.

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1811 MASON AVENUE
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MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

This Hoist
LIFTS PRODUCTION
LOWERS COSTS
Here's Why...

Each READING ELECTRIC HOIST installed in your plant is "tailor made"—at no extra cost—to fit your own handling operation. As a result you get a hoist that quickly moves your materials safely and easily.

Then too, the simple design of a READING ELECTRIC HOIST gives you a sure way to cut maintenance costs. There are only four moving parts in the hoisting unit. Each part is "easy-to-get-at" for routine inspection and overhauling.

For more information on how you can step-up production and cut costs with READING ELECTRIC HOISTS, contact your nearest Reading Distributor. And if you haven't already sent for your free copy of "144 Answers To Your Hoisting Problems," drop us a line today.

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WAA Administrator Gives Scrap Return Priority in Agency

Washington

• • • **WAA Administrator** Robert M. Littlejohn recently declared that the disposal agency is taking all possible steps to expedite return of scrap to industry and that scrap disposal will remain high on the list of unfinished business.

The WAA chief said more than 200,000 tons of scrap had been sold during the period of March through September. He warned that from this point on, sales volume of scrap by WAA will decline.

"There are certain classes of supplies," Mr. Littlejohn said, "such as machine tools, aircraft spare parts, etc., where ultimately additional scrap will be available. However, we cannot justify scrapping of this equipment until we have exhausted every effort to sell it over and above scrap prices."

Obviously, the greatest single source of WAA scrap lies with machine tools and industrial equipment. At present, according to WAA's third quarter report, this inventory consists roughly of $378 million. From this stock, JANMAT has still more than 50,000 units to select for set-asides for military reserves.

"Many prospective commercial buyers who have been holding off in anticipation of buying at scrap prices have suddenly rushed in to buy machine tools which were practically unsalable 60 or 90 days ago," Mr. Littlejohn said. "We are now getting a strong demand from rebuilders as well as users."

As a result, he said, the trend of recent months has been reversed and there is now a heavy demand even when the items are in only fair condition. This has cut down on potential scrap from this source.

Despite Backorders Swedish Production Trails 1946 Level

London

• • • **Orders on hand** at Swedish iron and steel works remain heavy, and further restrictions of sales for certain products have been necessary. Production is still hampered by the shortage of labor. The output of rolled and forged steel during the first 7 months of the year was 11,500 tons lower than during the corresponding period of 1946, and the production of castings was about 6,000 tons below that of last year. Imports of iron and steel have increased gradually since April.

There has been no change in the price level on the home market. There is still a heavy demand for high-quality steel on the export market, though in certain cases some slackening-off has become noticeable. This seems to be due primarily to the increased restrictions in several countries.

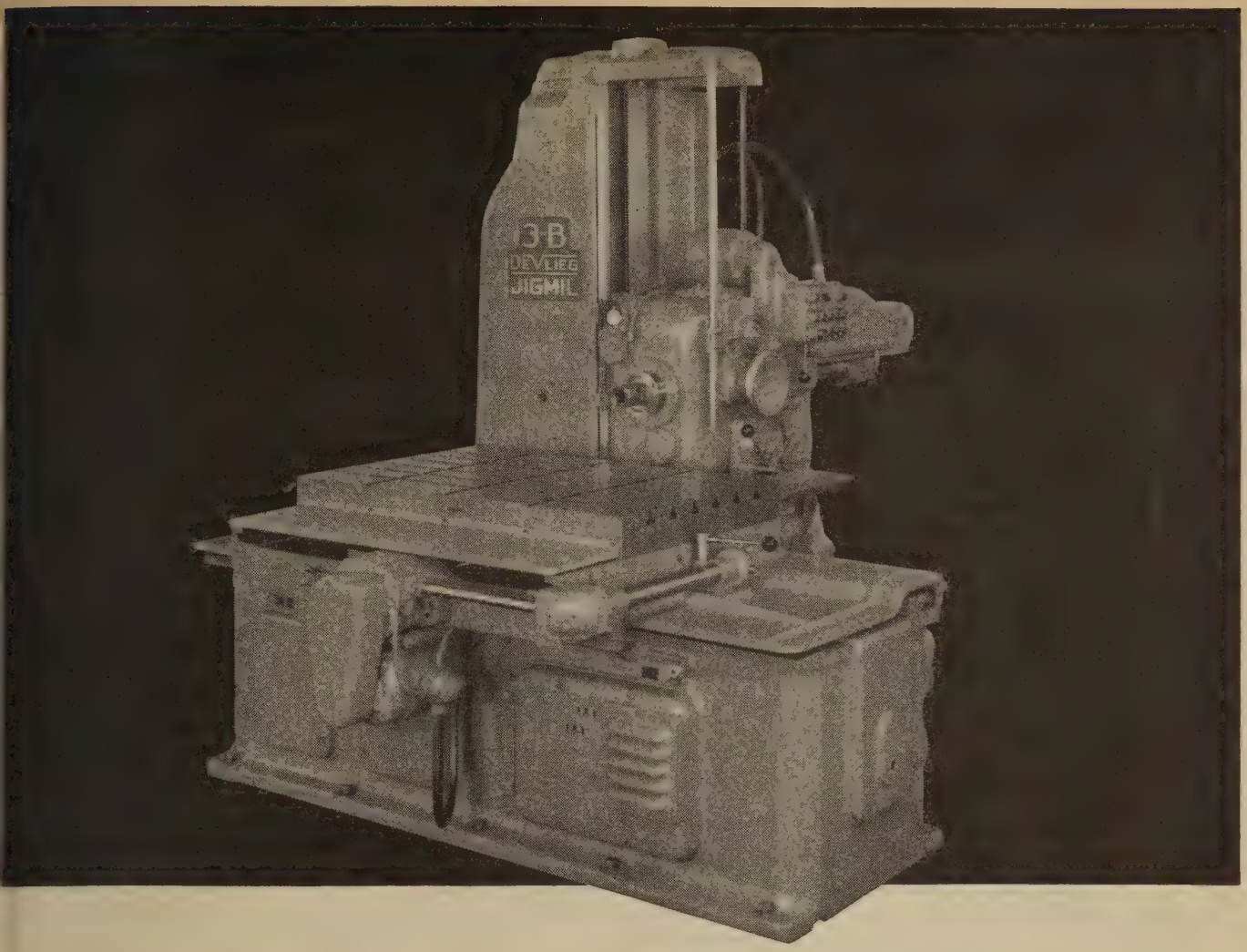
The supply of raw materials and fuel is causing increasing concern and the situation has been further aggravated by the rationing of electricity, introduced as a consequence of the present low level of water in Sweden's lakes and rivers.

Reported Disposals of WAA Iron and Steel Scrap and Salvage
March through September 1947

(In Gross Tons)

Period 1947	Total	Ferrous Products (exc. Machine Tools)		Over Age and Obsolete Special Machine Tools
		Offered as scrap	Offered as commodities	
March	70,000	5,000	63,000	2,000
April	11,750	4,750	4,000	3,000
May	59,925	10,875	17,300	31,750
June	17,350	9,413	1,962	5,975
July	18,166	7,847	1,005	9,314
August	22,418	12,789	5,854	3,775
September	6,940	3,721	1,090	2,129
Total	206,549	54,395	94,211	57,943

Statistics provided by the Office of General Disposal, War Assets Administration.



Those who examined the DeVlieg JIGMIL at the Chicago Show saw a complete new approach to the problems of precision boring. A method broadly applicable to economical repetitive *production work without jigs,* as well as a machine for most advantageously making jigs.

Write today for new descriptive booklet

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DeVLIEG MACHINE COMPANY

450 FAIR AVE., FERNDALE 20, (DETROIT) MICH.

October Shipments Hit $27,545,000; Up 17 pct Over Previous Month

• • • **Machine tool shipments** by the industry reached $27,545,000 in October, according to a preliminary report released by National Machine Tool Builders Association, which can be taken as documentary evidence that things for the time being are on the up-grade in most sectors of the industry.

New firm orders, the report showed, are up $4,700,000 over the September total, indicating that the Machine Tool Show was more of a stimulant to the market than the spottiness of some of the appropriation and money and tooling programs had led some observers to believe.

Despite the improvement in business in October, the industry is about to embark on an aggressive selling program, something like 1922 all over again, to prove the point that new machine tools must be considered not from the angle of cost but from the angle of their performance in reducing operating costs.

In essence, this program suggests to some observers that perhaps machine tool builders anticipate lean days to come and are getting the heavy artillery emplaced.

At the NMTBA fall conclave in Hot Springs, Alexander G. Bryant, vice president, Cleereman Machine Tool Co., Chicago and Green Bay, Wis., and president, Bryant Machinery & Engineering Co., Chicago, was elected president of NMTBA.

Lloyd D. McDonald, vice president, Warner & Swasey Co., Cleveland, was elected first vice president, and David Ayr, president, Hendy Machine Co., Torrington, Conn., was elected second vice president. Louis Polk, president, Sheffield Corp., Dayton, was re-elected treasurer.

New directors elected were David Ayr; Harold B. Smith, president, Illinois Tool Works, Chicago; and M. A. Hollengreen, executive vice president and general manager, Landis Tool Co., Waynesboro, Pa.

Cheaper Operating Units Shown At Chicago Show Believed To Be Responsible

o o o

Mr. Bryant told Association members that 1948 model machine tools are on the average at least one-third more productive than their corresponding types built prior to or during the war. He said a survey indicated that increases in efficiency range from as little as 10 pct on a few types to as much as 500 pct on some developments.

In Detroit, there are at the moment many more optimists than pessimists in the machine tool industry. Important new transfer-type machines are being delivered almost every week and the demand for this type of equipment appears to be, if anything, more insistent than ever. During the past week, Cross Co., one of Detroit's larger machine tool builders, held a press preview of its transfer-matic machine, which is said to be capable of turning out 150 rear axle housings per hr using only one operator. One of the "big three" automobile companies will use this machine to produce housings for its 1948 models.

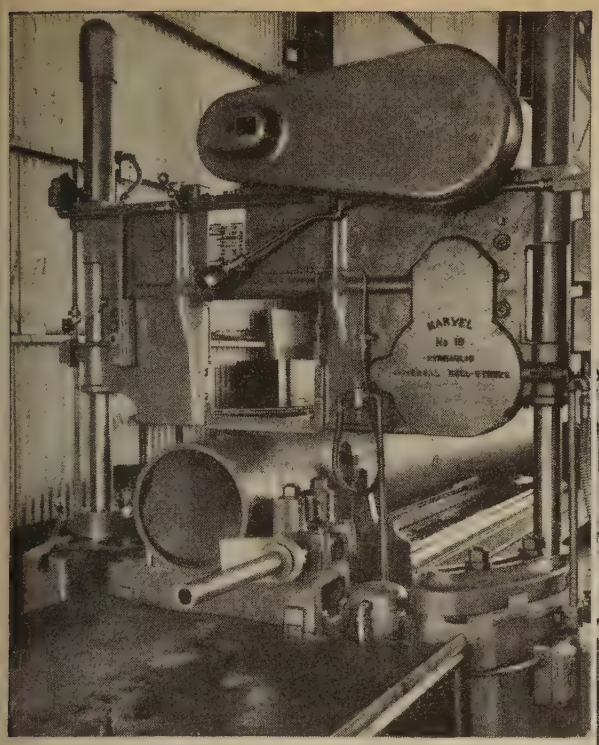
Always an optimistic sign here, the numerous requests being received for quotations on tool room equipment have been most encouraging to some segments of the industry.

Tool and die programs are also moving. Quotations have been requested, it is reported, from several GM divisions as well as at least two independent car and truck producers. It is also reported that a substantial part of the 1949 die program for Chrysler has been placed and there are indications that the large GM die program, long dormant, is about to be activated. It is expected that these two major programs will be the source of a considerable volume of Detroit business in th months ahead.

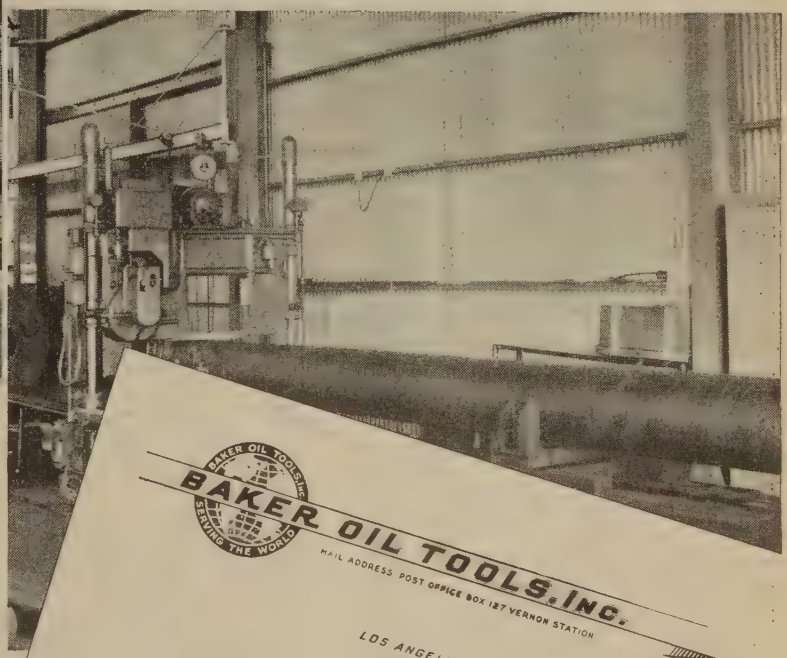
It now appears definite that th Kaiser-Frazer engine expansio program will center at Willo Run. Most sources here indicat that a substantial portion of th tooling for this program has al ready been placed. Best guess no is that production of engines a Willow Run will start in the earl Fall of 1948.

In the East, dealers report th influx of current business to b in spurts. There are reported t be more inquiries and leads fo business coming in to dealer offices than at any time since th war. Some observers attribute in quiry volume to the machine too show and are confident that ex hibitors' costs were warranted b present and prospective busines Production tools are not sellin well at this time in the East. Bus ness is reported to be steadil mounting in horizontal boring an milling machines. Brake and shea volume continues at a very hig level. Orders are coming in fo planers, shapers, lathes. An occa sional planer-miller is sold. Ther is some business in the smalle milling machines.

Although the bulk of sales o machine tools to Latin Americ continues to be tied up by shor ages of dollars, some orders ar reported by exporters to be re ceived from countries such a Mexico, Brazil and Ecuador. Ar gentine and Chilean business is a a minimum, but some exporter are receiving an occasional orde for a costly piece of equipmen from American copper, oil an other companies who buy thei equipment through their Ne York offices. There has been som talk of a large Export-Import Ban loan for some South America countries. This has not create the degree of interest in the trad which observers might have ex pected. There is a dispositio among all factors to see how thi matter develops before plannin further action.



TUBE CUTTING on a LARGE SCALE at BAKER OIL TOOLS, Inc.



Cutting-off steel tubing, generally considered a slow and costly operation is done quickly and economically, on a large scale, at Baker Oil Tools, Inc. two plants. Really large tubes, up to 18" in diameter are handled on the Giant No. 18 Marvel Hydraulic Hack Saw, illustrated above, quickly and accurately cutting off large steel oil well casing and casing coupling stock. This company also has a No. 6A MARVEL High Speed Production Saw, (capacity 6" x 6") for automatically cutting off single or nested tubes or bars of smaller diameter. Solid stock or tubes, they're all the same to MARVEL Saws.

Whatever your metal sawing problems, there are MARVEL Saws exactly suited to your requirements. Your local MARVEL Sawing Engineer will gladly analyze your problem, make recommendations and quote costs.

Write for Catalog

BAKER OIL TOOLS, INC.
MAIL ADDRESS POST OFFICE BOX 127 VERNON STATION
LOS ANGELES, CALIF.
August 11, 1947

Armstrong-Blum Mfg. Company
5700 Bloomingdale Avenue
Chicago 39, Illinois

Gentlemen:

We are well satisfied with the results which we are getting from our two Marvel #18 Hydraulic Hack Saws, and from the #6A Marvel High Speed Production Saw. Production time and production costs have been reduced since these machines have been in service.

At the present time we have a #9 Marvel Saw on order which will replace an obsolete machine and we are expecting to again improve our production when it is put into operation.

Your factory representatives have been very considerate and have taken care of our needs quite satisfactorily.

BAKER OIL TOOLS, INC.
C. A. McDonald
C. A. McDonald
Production Manager

MARVEL Metal Cutting SAWS
Better Machines - Better Blades

ARMSTRONG-BLUM MFG. COMPANY

5700 BLOOMINGDALE AVENUE **"The Hack Saw People"** **CHICAGO 39, U. S. A.**

NONFERROUS METALS

. . . News and Market Activities

Copper

• • • **Producers have sold** out all December metal and some are now taking January business. Brass mill consumption is growing and wire mills continue at peak levels. Export copper demand is improving but tonnages are reported to be small relative to those of the early summer. The reduction of the tariff on copper from 4¢ to 2¢ per lb will have no effect on the market until Mar. 31, 1949, when the current copper tariff suspension period ends. After that time any effect on the market would depend on the rate of domestic and foreign consumption relative to available world production. During normal times in the past, there has been no price spread between domestic and world market prices, which indicates that the duty of 4¢ was relatively ineffectual in keeping foreign production out of the domestic market. Secretary Krug's remarks at the El Paso meeting of the American Mining Congress on the necessity of expediting the accumulation of metals in the permanent stockpile have indicated to producers that there is a good prospect for Presidential approval of the Russell bill for subsidies on metals when it is reported out of Congress. Information from many sources indicates that no copper has yet gone into the stockpile. An advisory committee made up of industry members is now actively working on plans for expediting stockpile purchases.

•

Zinc

• • • **Reduction of the tariff** on zinc metal and ore as the result of the Geneva Conference merely served to continue existent emergency tariff rates after the declaration of the end of the emergency. The rate of duty on ore will remain at ¾¢ per lb instead of reverting to 1.2¢ 30 days after the end of the emergency. The rate of duty on metal remains at ⅞¢, instead of reverting to 1.7¢.

Demand for most grades of zinc remains strong but consumers can obtain their requirements of Prime Western and Special High Grade with a diligent search among producers. Other grades are readily obtainable.

•

Lead

• • • **Lead producers** have been unable to meet requirements of consumers and are attempting to allocate metal on the basis of previous consumption patterns. There was no action on the tariff on lead taken as the result of the Geneva Conference.

•

Metals Scrap Prices Rise

New York

• • • **Copper and brass,** aluminum, and some grades of lead and zinc scrap sold at higher prices last week as the result of increased buying by all consumers and a generally firmer undertone in the market. All grades of copper and brass scrap are selling at ½¢ per lb above the previous market. Aluminum pistons with struts are 1¢ higher; other aluminum grades are ½¢ higher, except mixed borings and turnings, unchanged. Lead battery plates are 1¢ higher, soft lead scrap unchanged. New zinc clips and old zinc sell at ½¢ higher. Zinc routings and old die cast scrap are unchanged.

The higher scrap prices prevailing are due to the depletion of inventories by refiners, ingot producers and foundries since the summer wave of curtailment. Up until the last few weeks, scrap buyers were reluctant to reenter the market in the belief that primary metal prices might be expected to drop soon. Reaching the end of their inventories with a growing conviction that metal prices are firm, most buyers have returned to the market. Ingot producers are not buying copper grades because the refineries are offering 1¢ per lb above their prices.

•

Nickel

• • • **A reduction of 1¼¢ per lb** in the price of refined nickel in the United States has been announced by International Nickel Co., Inc., effective Jan. 1. The reduction in price corresponds to the reduction on nickel provided for in the recently signed reciprocal trade agreement between the United States and Canada. The new contract price for 99.9 pct electrolytic nickel from the Port Colborne, Ont., refinery will be 33¾¢ per lb after Jan. 1. Prices of nickel outside the United States remain unchanged.

•

Offer Jap Lead Scrap

Washington

• • • **Sale in 21 lots,** aggregating 714 short tons of Japanese lead scrap on a sealed bid basis, has been announced by the U. S. Commercial Co., subsidiary of RFC. The material will be sold on an f.o.b. basis at seller's warehouse Staten Island. Terms and other conditions of the sale may be obtained from the U. S. Commercial Co., Washington, until Dec. 8.

•

Apex Smelting Buys Out National Smelting

Chicago

• • • **Apex Smelting Co.** here has announced the outright purchase of National Smelting Co., Cleveland, effective Jan. 1. After that time it was stated that the plant would be identified as the Apex Smelting Co., Cleveland Plant. The announcement was made by W. A. Singer, president of Apex Smelting Co. Mr. Abraham Rubin, vice-president of National Smelting Co., will become a director and officer of Apex on that date and manager of the Cleveland plant.

Nonferrous Metals Prices

Cents per pound

	Nov. 19	Nov. 20	Nov. 21	Nov. 22	Nov. 24	Nov. 25
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$35.50
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$81 to $83
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$62 to $65
Silver, New York, cents per oz.	74.625
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.06
Zirconium copper, 6 pct Zr. per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No 115	17.50-18.00
No. 120	17.00-17.50
No. 123	16.50-17.00
80-10-10 ingot	
No. 305	21.50-22.00
No. 215	19.50-20.00
88-10-2 ingot	
No. 210	27.25-27.75
No. 215	25.75-26.25
No. 245	19.75-20.25
Yellow ingot	
No. 405	13.75-14.50
Manganese Bronze	
No. 421	15.75-16.50

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75-16.00
0.60 copper, max.	15.50-15.75
Piston alloys (No. 122 type)	15.25-15.50
No. 12 alum. (No. 2 grade)	14.75-15.00
108 alloy	15.00-15.25
195 alloy	15.50-16.00
AXS-679	15.00-15.50
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-95½ pct	14.75-15.00
Grade 2—92 pct-95 pct	13.75-14.00
Grade 3—90 pct-92 pct.	13.25-13.50
Grade 4—85 pct-90 pct.	12.75-13.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33¾
Zinc, Cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 99 pct, crystals, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall; 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75-S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness; 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam. rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢ 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75.

Round Rod: M, diam, in., ¼ to ⅝, 47¢; ½ to ¾, 45¢ 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅝, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ⅝, $1.12; ⅝ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per pound, f.o.b. mill effective June 11)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16 —16½
No. 2 heavy copper and wire	15 —15½
Light copper	13½—14
Auto radiators (unsweated)	8¾— 9¼
No. 1 composition	11½—12
No. 1 composition turnings	11 —11½
Clean red car boxes	9½—10
Cocks and faucets	9¼— 9¾
Mixed heavy yellow brass	7 — 7½
Old rolled brass	7½— 8
Brass pipe	8¾— 9¼
New soft brass clippings	11½—12
Brass rod ends	9 — 9½
No. 1 brass rod turnings	8½— 9

Aluminum

Alum. pistons with struts	4½— 5
Aluminum crankcases	6 — 6½
2S aluminum clippings	9 — 9½
Old sheet & Utensils	6 — 6½
Mixed borings and turnings	— 2
Misc. cast aluminum	5½— 6
Dural clips (24S)	5 — 5½

Zinc

New zinc clippings	6 — 6½
Old zinc	4½— 5
Zinc routings	2½— 3
Old die cast scrap	2½— 3

Nickel and Monel

Pure nickel clippings	15½—17½
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
Nickel silver clippings, mixed	7½— 8
Nickel silver turnings, mixed	5½— 6

Lead

Soft scrap lead	10¾—11¼
Battery plates (dry)	6 — 6½

Magnesium Alloys

Segregated solids	6½— 7
Castings	4½— 5½

Miscellaneous

Block tin	63 —65
No. 1 pewter	48 —50
No. 1 auto babbitt	38 —40
Mixed common babbitt	11½—12
Solder joints	14½—15
Siphon tops	38 —40
Small foundry type	13 —13½
Monotype	12 —12½
Lino and stereotype	11½—12
Electrotype	10 —10½
New type shell cuttings	11 —11½
Clean hand picked type shells	4½— 5
Lino and stereo dross	5 — 5½
Electro dross	3¼— 3½

Lead Products

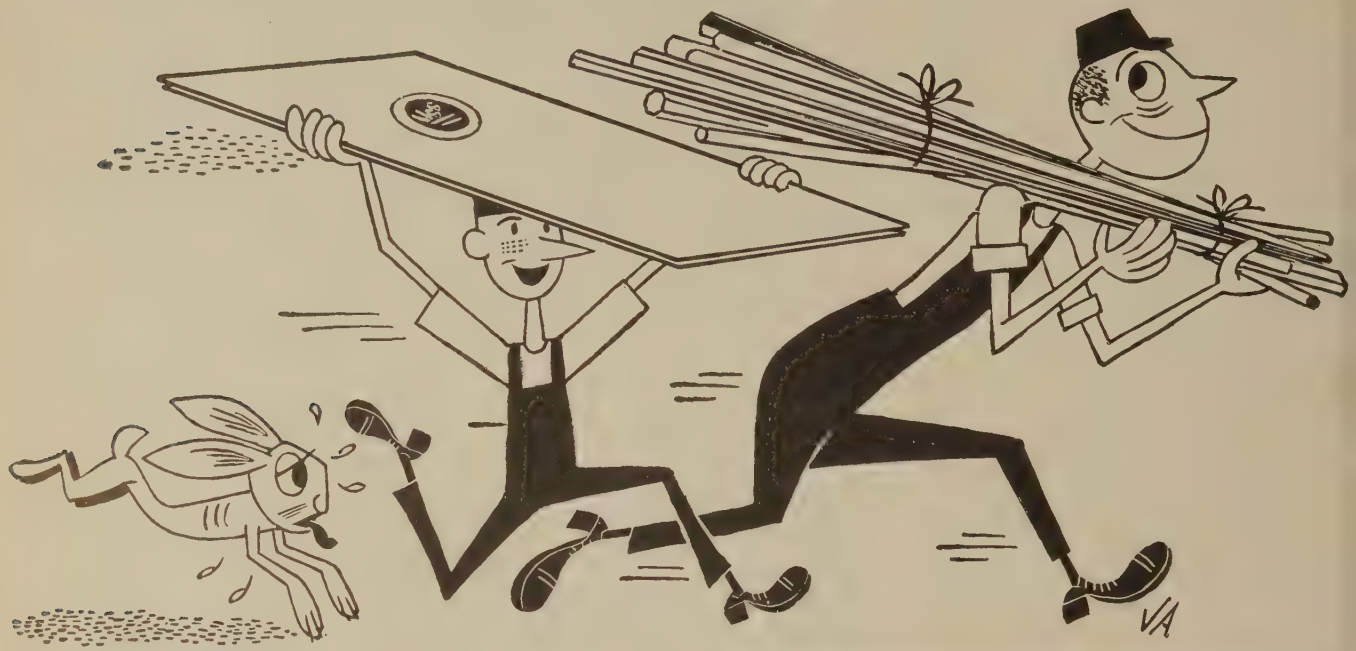
(Cents per lb)

F.o.b. shipping point freight collect Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

SPEEDY

deliveries on U·S·S Stainless Steel



Now you can get all the Stainless Steel you want. This means that we have available for your needs—No. 2B finish sheets of proven excellence; No. 4 finish sheets of uniform quality; bars that meet high standards of machinability; plates in sizes up to 120" wide and 360" long; tubing—both welded and seamless; pipe, angles, channels and welding electrodes in all standard grades and specifications.

If you need help in selecting the grades of U·S·S Stainless that will best suit different kinds of service or fabricate best on your equipment, our engineers will gladly assist you. Free technical bulletins and booklets covering the varied uses for U·S·S Stainless are also yours for the asking.

Once a month we publish an up-to-date Inventory Bulletin, listing our Stainless stocks. If you use Stainless Steel and are not receiving these bulletins, write us.

So, whether you want help or want to give us an order, phone, wire or write our nearest warehouse and you'll get prompt, courteous service.

Symbol of Service

FOR STEEL USERS

UNITED STATES STEEL SUPPLY COMPANY

USS STEELS SERVICE

UNITED STATES STEEL SUPPLY COMPANY

CHICAGO (90)	1319 Wabansia Ave., P. O. Box MM	BRUnswick 2000
BALTIMORE (3)	Bush & Wicomico Sts., P. O. Box 2036	GIlmor 3100
BOSTON	176 Lincoln St., (Allston 34), P. O. Box 42	STAdium 9400
CLEVELAND (14)	1394 East 39th St.	HEnderson 5750
LOS ANGELES (54)	Slauson Avenue (Between Alameda and Sante Fe)	LAfayette 0102
MILWAUKEE (1)	4027 West Scott St., P. O. Box 2045	MItchell 7500
NEWARK (1), N. J.	Foot of Bessemer St., P. O. Box 479	BIgelow 3-5920 REctor 2-6560—BErgen 3-1614
PITTSBURGH (12)	1281 Reedsdale St., N. S.	CEdar 7780
ST. LOUIS (3)	311 S. Sarah St., P. O. Box 27	LUcas 0440
TWIN CITY	2545 University Ave., St. Paul (4), Minn.	NEstor 7311

UNITED STATES STEEL

Testing Period Begins; Some Strength Remains

New York

• • • **The important price** testing period has arrived, and is expected to last from days to weeks. To review the month-old efforts of principal scrap consumers to reduce the level of scrap prices, it is clear that the mills won the first round of the battle. The action of steel mills in halting purchases late in October has certainly served to break the sharp upward spiral of scrap prices.

The second stage of the battle, to reduce existing levels for scrap, has met with partial success. In Chicago and in Pittsburgh there have been sales of scrap at prices under the peak which was reached in October, but the total tonnage has not been large. Meanwhile, in other markets such as Philadelphia and Birmingham there are lingering effects of the previous strength.

At present, the wholesale boycotting of existing offers by dealers and brokers continues. How long this condition can exist, in the face of descending winter weather and high steel operating rates remains to be seen.

In the East, old high priced orders are still good for this week, for shipment to Eastern Pennsylvania mills. After this week, even this activity will have ceased.

The elimination of high priced orders in Pittsburgh reduced the top price for No. 1 heavy melting steel scrap there from $45 to $40 per ton. An increase of 50¢ per ton in Philadelphia, combined with the Pittsburgh change, reduced THE IRON AGE heavy melting steel scrap composite price to $40.58 per gross ton, down 67¢ from last week.

•

PITTSBURGH—Early this week there was no new openhearth buying. Cancellation of the major portion of higher priced openhearth grade orders on Nov. 22 ended for the time being their $45 and $47 out of district prices as a market factor. So far, mills appear determined not to go over $40 delivered here though a "Little OPA system" springboard may eventually mean somewhat of a range on openhearth here. Meanwhile there are unconfirmed reports that some $40 purchases were made after notice of termination of the higher priced orders had been given. The market this week is therefore quotable at a flat $40. A tough testing period is seen ahead for this price for two reasons: (1) Winter is coming; and (2) dealer activity generally slacks off in the last month of a good year for income tax reasons. Other grades are not weaker in sympathy with the openhearth material. Cupola cast was up 50 cents for the week.

•

CHICAGO—With the mad rush to complete shipment of high priced orders before the deadline over, many brokers and dealers are now concentrating on and studying freight rates. The springboard of $22 for the eight Western states is rather clean cut, but the $30 gross ton price on all other states didn't make sense until the mills referred their sources to the definition of remote states as outlined in the long since dead OPA ruling. Foundries continue to compete with the mills for electric furnace grades and railroad heavy melting scrap. This has necessitated a wide spread in price in order to truly report the market on such items.

•

PHILADELPHIA—The heavy melting market was stronger here last week. Brokers are paying more than $43 delivered. The f.o.b. Philadelphia price is $42. Mills are reported willing to pay a $2.50 premium over the market for a guaranteed tonnage of No. 1 melting. Turnings have been sold at 50¢ above last week's market; shovelings at $1 above. Heavy breakable cast and railroad specialties have sold at $1 higher; heavy axle forge turnings $1.50 higher. Brokers are buying scrap in New York and New Jersey for mills here. One mill is holding to its price of $38.50 f.o.b. Philadelphia, $37.50 Baltimore and getting scrap from steel consumers direct or through dealers.

•

CLEVELAND — Earmarked scrap was moving here and in the Valley at "Little OPA" prices and some segments of the trade were giving lip service, at least, to the new pricing system. Indications are that a period of testing, lasting for about two weeks, will be in order before the market can be stabilized. Mills' policing of customers' scrap is freezing out foundries and electric furnaces and forcing them to pay higher prices. All in all, it looks like a nice winter.

•

DETROIT — Open hearth scrap prices here are holding at the same level as last week except for turnings which are reported to be slightly on the weak side. While the volume of scrap moving is said to be somewhat lower than a month ago, there is not as yet any indication that unusually large tonnages are being withheld by dealers. The pressure on low phos prices is admittedly high particularly where this grade is required to produce ingots used in conversion deals.

•

BUFFALO—Activity in cast scrap featured the market this week. Sales of mixed cast, adding up to a good tonnage, were reported at $50, or $3 over the last previous quotation for No. 1 cupola. However, it was still no dice in open hearth grades at the $39.25 bid by mills, and dealers were predicting a continuation of the stalemate until after the turn of the year.

•

NEW YORK—Activity here was still centered around the cleaning up of old orders, many of which have through the rest of this week to run. The movement out of this area to Pittsburgh on old orders has largely been completed. New ordering for December delivery had not yet materialized at midweek.

•

BOSTON—Outstanding old orders were cancelled Nov. 22. One final heavy melting sale for Pittsburgh delivery was reported at $38 on cars or about $46.50 delivered. Several sales for eastern Pennsylvania delivery were made at $36. Since then the trade has been sitting back awaiting developments, no business having been reported on any new price basis. On the other hand foundries, especially small, are buying cast as fast as available at as high as $45 f.o.b. for car lots and $50 delivered by truck on long hauls.

•

CINCINNATI — The market here remains the same as last week, with demand strong, scrap scarce, and prices at the same level. Dealers indicated that they are waiting for the results of an effort to hold the price of scrap to a $39 mark or even lower, not because of the scrap situation itself but because there is a feeling that prices have risen to an extreme degree and should be brought back to a more normal figure.

•

BIRMINGHAM — Mills in this area have advanced their offer for open hearth grades to $37, an advance of $2 per ton. But it will be the first of December before dealer response can be gaged accurately. Old orders, made at $38, will not be filled before that time. At the first of this week it was doubtful that substantial tonnages could be purchased for less than $39.50. Meantime there is little trading in any type of material and rainy weather has slowed both collection and preparation.

•

ST. LOUIS—The market for scrap iron in the St. Louis industrial district remains tight with shippers reluctant to ship to the open hearth mills at prevailing prices. Melting grades are unchanged in price but some foundry items are $1 a ton higher. It is understood that only a small portion of the Louisville and Nashville list of 10,500 tons went to this market. The St. Louis-San Francisco list of 52 carloads is pending.

•

TORONTO — With winter conditions setting in over the rural districts, there was noticeable slowing down in scrap iron and steel receipts by local dealers during the past week, with only a few deliveries made from outside points. Most of the available supply is from industrial plants and dealers now are down to about 25 pct in meeting consumer requirements.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00
RR. hvy. melting	40.50 to 41.00
No. 2 hvy. melting	40.00
RR. scrap rails	49.00 to 50.00
Rails 2 ft. and under	53.00 to 54.00
No. 1 comp'd bundles	40.00
Hand bdld. new shts.	40.00
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	36.50 to 37.00
Mixed bor. and turn.	35.00 to 35.50
Cast iron borings	35.50 to 36.00
No. 1 cupola cast.	51.50 to 52.50
Hvy. breakable cast.	40.00 to 40.50
Malleable	57.00 to 58.00
RR. knuck, and coup.	52.00 to 53.00
RR. coil springs	52.00 to 53.00
RR. leaf springs	52.00 to 53.00
Rolled steel wheels	52.00 to 53.00
Low phos.	47.00 to 48.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.00
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundles	38.50 to 39.00
No. 2 dealers' bundles	38.50 to 39.00
Bundled mach. shop turn.	38.50 to 39.00
Galv. bundles	36.50 to 37.00
Mach. shop turn.	33.50 to 34.00
Short shov. turn.	35.50 to 36.00
Cast iron borings	34.50 to 35.00
Mix. borings & turn.	33.50 to 34.00
Low phos, hvy. forge	44.00 to 48.00
Low phos, plates	41.50 to 45.00
No. 1 RR. hvy. melt.	41.25 to 46.00
Rerolling rails	59.00 to 60.00
Miscellaneous rails	50.00 to 51.00
Angles & splice bars	50.00 to 51.00
Locomotive tires, cut	49.00 to 50.00
Cut bolster & side frames	48.00 to 48.50
Standard stl. car axles	55.00 to 56.00
No. 3 steel wheels	49.00 to 50.00
Couplers & Knuckles	48.00 to 50.00
Rails 2 ft. and under	55.00 to 56.00
Malleable	65.00 to 66.00
No. 1 mach. cast.	53.00 to 54.00
No. 1 agricul. cast.	49.00 to 50.00
Hvy. breakable cast.	41.00 to 43.00
RR. grate bars	47.00 to 48.00
Cast iron brake shoes	48.00 to 49.00
Cast iron carwheels	45.50 to 46.50

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 bundles	38.00 to 40.00
No. 2 bundles	38.00 to 40.00
Mach. shop turn.	33.00 to 34.00
Shoveling turn.	33.00 to 34.00
Cast iron borings	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Low phos. plate	49.00 to 50.00
No. 1 cupola cast.	51.00 to 53.00
Hvy. breakable cast.	42.00 to 43.00
Scrap rails	47.00 to 48.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy melting	$35.00 to $36.00
No. 2 hvy. melting	35.00 to 36.00
Nos. 1 and 2 bundles	35.00 to 36.00
Busheling	35.00 to 36.00
Shoveling turn.	31.50 to 32.00
Machine shop turn.	29.00 to 30.00
Mixed bor. & turn.	29.00 to 30.00
Cl'n cast. chem. bor.	33.00 to 34.00
No. 1 machinery cast.	44.00 to 45.00
No. 2 machinery cast.	44.00 to 45.00
Heavy breakable cast.	40.00 to 41.00
Stove plate	39.00 to 40.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$34.75 to $35.25
No. 2 hvy. melting	34.75 to 35.25
No. 1 bundles	34.75 to 35.25
New busheling	34.75 to 35.25
Flashings	34.75 to 35.25
Mach. shop turn.	28.50 to 29.00
Shoveling turn.	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	29.50 to 30.00
Low phos. plate	41.75 to 42.25
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	40.00 to 41.00
Stove plate	40.00 to 41.00
Automotive cast.	46.00 to 47.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.50
No. 2 hvy. melting	42.50 to 43.50
No. 1 bundles	42.50 to 43.50
No. 2 bundles	42.50 to 43.50
Mach. shop turn.	33.50 to 34.50
Shoveling turn.	35.00 to 36.00
Mixed bor. & turn.	33.50 to 34.50
Clean cast chemical bor.	39.00 to 41.00
No. 1 machinery cast.	52.00 to 54.00
No. 1 mixed yard cast.	49.00 to 50.00
Hvy. breakable cast.	49.00 to 50.00
Clean auto cast.	52.00 to 54.00
Hvy. axle forge turn.	43.50 to 44.50
Low phos. plate	47.00 to 48.00
Low phos. punchings	47.00 to 48.00
Low phos. bundles	46.00 to 47.00
RR. steel wheels	50.00 to 51.00
RR. coil springs	50.00 to 51.00
RR. malleable	60.00 to 65.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.50 to $41.00
No. 2 hvy. melting	38.00 to 39.00
Bundled sheets	38.00 to 39.00
Mach. shop turn.	32.00 to 33.00
Locomotive tires, uncut	45.00 to 46.00
Mis. std. sec. rails	48.00 to 49.00
Rerolling rails	55.00 to 56.00
Steel angle bars	48.00 to 49.00
Rails 3 ft. and under	52.00 to 53.00
RR. steel springs	46.00 to 47.00
Steel car axles	46.00 to 48.00
Grate bars	44.00 to 45.00
Brake shoes	46.00 to 47.00
Malleable	63.00 to 64.00
Cast iron car wheels	46.00 to 47.00
No. 1 machinery cast.	46.00 to 47.00
Hvy. breakable cast.	39.00 to 40.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	37.00 to 38.00
Long turnings	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	46.00 to 47.00
Stove plate	43.00 to 44.00
No. 1 RR. hvy. melt.	36.00 to 37.00
Steel axles	38.00 to 39.00
Scrap rails	37.50 to 38.00
Rerolling rails	48.00 to 49.00
Angles & splice bars	40.00 to 41.00
Rails 3 ft. & under	40.00 to 41.00
Cast iron carwheels	35.00 to 36.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Short shov. turn.	36.50 to 37.00
Cast iron borings	36.00 to 36.50
Low phos	47.00 to 47.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	39.00
No. 2 bundles	39.00
Comp. galv. bundles	37.00
Mach. shop turn.	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Shoveling turn.	31.00 to 32.00
No. 1 cupola cast.	43.50 to 44.00
Hvy. breakable cast.	43.50 to 44.00
Charging box cast.	43.50 to 44.00
Stove plate	43.50 to 44.00
Clean auto cast.	43.50 to 44.00
Unstrip. motor blks.	40.50 to 41.50
Cl'n chem. cast bor.	33.50 to 34.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	39.00 to 40.00
Mach. shop turn.	32.50 to 33.50
Shoveling turn.	34.50 to 35.50
Cast iron borings	31.50 to 32.50
Mixed bor. & turn.	31.50 to 32.50
No. 1 cupola cast.	48.00 to 50.00
Charging box cast.	46.00 to 48.00
Stove plate	47.00 to 49.00
Clean auto cast.	48.00 to 50.00
RR. Malleable	60.00 to 65.00
Small indl. malleable	45.00 to 47.00
Low phos. plate	44.00 to 45.00
Scrap rails	47.00 to 48.00
Rails 3 ft. & under	50.00 to 52.00
RR. steel wheels	46.00 to 48.00
Cast iron carwheels	46.00 to 48.00
RR. coil & leaf spgs.	46.00 to 48.00
RR. knuckles & coup.	46.00 to 48.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 2 bundles	39.00 to 39.50
No. 1 busheling	39.00 to 39.50
Drop forge flashings	39.00 to 39.50
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	35.00 to 35.50
Steel axle turn.	39.00 to 39.50
Cast iron borings	35.00 to 35.50
Mixed bor. & turn.	35.00 to 35.50
Low phos.	43.00 to 43.50
No. 1 machinery cast.	56.00 to 60.00
Malleable	65.00 to 68.00
RR. cast.	57.00 to 58.00
Railroad grate bars	48.00 to 50.00
Stove plate	52.00 to 54.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft. & under	57.00 to 58.00
Rails 18 in. & under	58.00 to 60.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	25.00
No. 2 bales	25.00

Per gross ton delivered to consumer:

No. 3 bales	$19.50
Mach. shop turn.	16.00
Elec. furn. 1 ft. und	$32.00 to 34.00
No. 1 cupola cast.	32.00 to 33.00
RR. hvy. melting	26.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$25.50
No. 2 hvy. melting	25.50
No. 1 bales	25.50
No. 2 bales	25.50
No. 3 bales	19.50
Mach. shop turn.	17.50
No. 1 cupola cast.	$36.00 to 40.00
RR. hvy. melting	26.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$24.00 to $26.50
Elec. furn. 1 ft. and und.	27.50 to 30.00
No. 1 cupola cast.	27.50
RR. hvy. melting	25.00 to 26.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact., prep'd	21.00*
Bushelings, new fact., unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	36.00 to 40.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

	Nov 25, 1947	Nov. 18, 1947	Oct. 28, 1947	Nov. 26, 1946
Flat-rolled Steel: (cents per pound)				
Hot-rolled sheets	2.80	2.80	2.80	2.425
Cold-rolled sheets	3.55	3.55	3.55	3.275
Galvanized sheets (10 ga.)	3.95	3.95	3.95	4.05*
Hot-rolled strip	2.80	2.80	2.80	2.45
Cold-rolled strip	3.55	3.55	3.55	3.05
Plates	2.95	2.95	2.95	2.50
Plates wrought iron	6.85	6.85	6.85	4.112
Stain's c-r strip (No. 302) *24 gage	30.50	30.50	30.50	30.30
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes.	$5.75	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.50
Cold-finished bars	3.55	3.55	3.55	3.10
Alloy bars	3.30	3.30	3.30	2.92
Structural shapes	2.80	2.80	2.80	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	7.15	4.76
Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.05
Wire nails	4.25	4.25	4.25	3.75
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$43.39*
Light rails	3.10	3.10	3.10	49.18*
*per net ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00	$45.00	$45.00	$39.00
Sheet bars	66.00	66.00	66.00	38.00
Slabs, rerolling	45.00	45.00	45.00	39.00
Forging Billets	55.00	55.00	55.00	47.00
Alloy blooms, billets slabs	66.00	66.00	66.00	58.43
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.30
Skelp	2.60	2.60	2.60	2.05

	Nov 25, 1947	Nov. 18, 1947	Oct. 28, 1947	Nov. 26, 1946
Pig Iron: (per gross ton)				
No. 2, foundry, Phila.	$40.97	$40.97	$41.36	$30.43
No. 2, Valley furnace	36.50	36.50	36.50	28.50
No. 2, Southern Cin'ti	40.24	40.24	40.24	27.80
No. 2, Birmingham	34.88	34.88	34.88	24.88
No. 2, foundry, Chicago†	36.00	36.00	36.00	28.50
Basic del'd Philadelphia	40.47	40.47	40.86	29.93
Basic, Valley furnace	36.00	36.00	36.00	28.00
Malleable, Chicago†	36.50	36.50	36.50	28.50
Malleable, Valley	36.50	36.50	36.50	28.50
Charcoal, Chicago	56.04	56.04	56.04	42.34
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	*$40.00*	$42.50	$42.50	$25.25
Heavy melt'g steel, Phila.	**43.00**	42.50	42.50	24.50
Heavy melt'g steel, Ch'go	38.75	38.75	42.75	25.25
No.1, hy. comp. sheet, Det.	34.75	34.75	34.75	22.32
Low phos. Youngs'n	47.25	46.25	46.25	27.75
No. 1, cast, Pittsburgh	**52.00**	51.50	47.50	29.00
No. 1, cast, Philadelphia	53.00	53.00	53.00	40.50
No. 1, cast, Chicago	52.50	52.50	52.50	37.75
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$8.75
Foundry coke, prompt	14.00	14.00	14.00	8.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	19.50
Copper, Lake, Conn.	21.625	21.625	21.625	19.50
Tin, Straits, New York	80.00	80.00	80.00	70.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	11.65
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	23.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Nov. 25, 1947	3.18925¢ per lb.	$36.96 per gross ton.	$40.58 per gross ton.
One week ago	3.18925¢ per lb.	$36.96 per gross ton.	$41.25 per gross ton.
One month ago	3.18925¢ per lb.	$36.96 per gross ton.	$42.58 per gross ton.
One year ago	2.70711¢ per lb.	$28.13 per gross ton.	$25.00 per gross ton.

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1947	3.18925¢ Aug. 12	2.87118¢ Jan. 7	$37.35 Aug. 10	$30.14 Jan. 7	$42.58 Oct. 28	$29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over, (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Spot market as high as $92 gross ton or higher. (17) Delivered Los Angeles: add ½¢ per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) $2 more, (21) $1 more. Some producers charge (22) 0.05¢ less, (23) 0.10¢ less, (24) 0.20¢ less.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO Detroit	New York	Philadelphia
INGOTS															
Carbon, rerolling	($36.00 f. o. b. mill) (Spot market as high as $86 to $90 gross ton)														
Carbon, forging	$46.00														
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS															
Carbon, rerolling [18]	$45.00[19]	$45.00[19]	$45.00[19]	$47.00	$45.00[19]	$45.00[19]							$48.00[19]		
Carbon, forging billets	$55.00	$55.00	$55.00	$55.00	$55.00	$55.00							$58.00		
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)						$69.00		
SHEET BARS[16]							$66.00								
PIPE SKELP	2.60¢[21]	2.65¢					2.60¢[21]								
WIRE RODS	2.80¢[21]	2.80¢[21]		2.80¢[21]	2.85¢		(Worcester = 2.90¢[21])					3.52¢[13]			
SHEETS															
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	3.175¢	(Ashland, Ky. = 2.80¢)		3.54[17]¢	2.95¢	3.12¢	3.02¢
Cold-rolled[1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	4.00¢	3.97¢
Galvanized (10 gage)	3.95¢[23]	3.95¢[23]	3.95¢[23]		3.95¢[23]		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.62[17]¢		4.27¢	4.17¢
Enameling (12 gage)	3.95¢[22]	3.95¢[22]	3.95¢[22]	3.95¢			3.95¢		4.05¢	3.95¢			4.10¢[22]	4.42¢	4.37¢
Long ternes [2] (10 gage)	4.05¢[24]	4.05¢[24]	3.85¢											4.52¢	4.47¢
STRIP															
Hot-rolled [3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[17]	2.95¢	3.27¢	3.22¢
Cold-rolled [4]	3.55¢	3.65¢		3.55¢			3.55¢			(Worcester = 3.75¢)			3.70¢	4.02¢	3.97¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.57¢	
TINPLATE															
Standard cokes, base box	$5.75	$5.75	$5.75		$5.85			$5.85	$5.85	(Warren, Ohio = $5.75)				$6.175	$6.074
Electro, box { 0.25 lb.	Deduct 90¢ from standard coke base box price.														
Electro, box { 0.50 lb.	Deduct 70¢ from standard coke base box price.														
Electro, box { 0.75 lb.	Deduct 50¢ from standard coke base box price.														
BLACKPLATE, 29 gage[5]	3.90¢	3.90¢	3.90¢		4.00¢			4.00¢	4.00¢					4.32¢	4.22¢
BLACKPLATE, CANMAKING															
55 lb. to 70 lb.	Deduct $1.55 from standard coke base box.														
75 lb. to 95 lb.	Deduct $1.65 from standard coke base box.														
100 lb. to 118 lb.	Deduct $1.55 from standard coke base box.														
TERNES, MFG., Special coated	Deduct 85¢ from standard coke base box price.														
BARS															
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625[17]¢	3.05¢	3.35¢	3.32¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325[17]¢		3.07¢	2.97¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.70¢	4.00¢	3.97¢
Alloy, hot-rolled	3.30¢	3.30¢				3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)					3.45¢		3.45¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢							4.25¢		
PLATE															
Carbon steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	(Coatesville = 3.15¢, Claymont = 3.15¢, Geneva, Utah = 3.10¢) 2.95¢				3.76[14]¢		3.27¢	3.17¢
Floor plates	4.20¢	4.20¢												4.67¢	4.62¢
Alloy	3.80¢	3.80¢			(Coatesville = 4.50¢)									4.27¢	4.22¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 3.95¢, Bethlehem = 2.80¢)					3.43[10]¢		3.02¢	2.95¢
SPRING STEEL, C-R															
0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9]															
Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56[13]¢		3.99¢	3.97¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)							5.28[13]¢		5.04¢	4.96¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.72¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt, Beth	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.78
Tubing, seamless, P'gh, Chi, Canton (4 to 6 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co	Base Per lb
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., per 100 lb	$2.75
Angle splice bars, 100 lb	3.25
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Fittsburg, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Weirton, W. Va.; St. Louis, Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	Delivered San Francisco
Standard & coated nails	$4.25†	$5.33
Galvanized nails‡‡	4.00†	5.08
Cut nails, carloads, Pittsburgh base	5.80*	....

† 10¢ additional at Cleveland, 35¢ at Worcester. ‡‡ Plus $2.75 per 100 lb galvanizing extra. *Less 20¢ to jobbers.

	Base per 100 lb	
Annealed fence wire	$4.20‡	$5.31
Annealed galv. fence wire	4.65‡	5.66

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base	column
Woven wire fence*	91	114
Fence posts, carloads	90††	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barbless wire	101	...

* 15½ gage and heavier. ** On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized	....	5.85	....	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Cold-rolled	....	....	....	....	....	....	....	....	....
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 6.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts. f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
½-in.	50½	34½
¾-in.	53½	38½
1-in.	56	41½
1¼-in.	56½	42
1½-in.	57	42½
2 in.	57½	43
2½ and 3-in.	58	43½
Wrought iron, buttweld		
⅛-in.	+ 7	+29
¼-in.	2½	+19
⅜ and 1¼-in.	8	+11
1½-in.	13½	+ 7½
2-in.	14	+ 7
Steel, lapweld		
2-in.	49	34
2½ and 3-in.	52	37
3½ to 6-in.	54	39
Steel, seamless		
2-in.	48	33
2½ and 3-in.	51	36
3½ to 6-in.	53	38
Wrought Iron, lapweld		
2-in.	5½	+14½
2½ to 3½-in.	8	+10½
4-in.	12	+ 5
4½ to 8-in.	10	+ 6½

Extra Strong, plain ends

Steel, buttweld		
½-in.	49½	35
¾-in.	53½	39
1-in.	55½	42
1¼-in.	56	42½
1½-in.	56½	43
2-in.	57	43½
2½ and 3-in.	57½	44
Wrought Iron, buttweld		
⅛-in.	+ 2½	+23
¼-in.	3½	+17
1 to 2-in.	13	+ 7
Steel, lapweld		
2-in.	48	34
2½ and 3-in.	52	38
3½ to 6-in.	55½	41½
Steel, seamless		
2-in.	47	33
2½ and 3-in.	51	37
3½ to 6-in.	54½	40½
Wrought Iron, lapweld		
2-in.	8½	+11
2½ to 4-in.	17½	+ ½
4½ to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

OD in.	Gage BWG	Seamless Hot-Rolled	Seamless Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$16.67	$19.99	$16.17	$19.39
2½	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3½	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

CAST IRON WATER PIPE

Per net ton

6-in. to 24-in. del'd Chicago $86.12
6-in. to 24-in. del'd New York..... 84.18
6-in. to 24-in., Birmingham 74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less 100.90

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter..	45
9/16 & ⅝ in. x 6 in. & shorter.....	46
¾ in. & larger x 6 in. & shorter....	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long.....	44
Lag, all diam x 6 in. & shorter.....	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller		46
½ in. and smaller	44	..
½ in. through 1 in.		44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in. ..	41	42
1⅝ in and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate .... 65 and 10
In bulk 75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets *(½ in. and larger)*

Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $5.65
F.o.b. Lebanon, Pa. 5.80

Small Rivets *(7/16 in. and smaller)*

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 55

Cap and Set Screws

(In packages) *Percent Off List*

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright 53
¾ to 1 in. x 6 in., SAE 1035, heat treated 44
Set screws, cup and oval points 57
Milled studs 31
Flat head cap screws, listed sizes.. 16
Fillister head cap, listed sizes..... 37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh.....24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh .....30¢ to 31½¢
Copper, reduced, 150 and 200 mesh ..... 29¢ to 30½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots....10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags. 7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots ..... 5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots .....63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe .....35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe.... 29¢ to 32¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe.....90¢ to $1.75
Aluminum, 100, 200 mesh, carlots .....23¢ to 26¢
Antimony, 100 mesh ..... 36.05¢
Cadmium, 100 mesh $2.00
Chromium, 100 mesh and finer.... $1.025
Lead, 100, 200, & 300 mesh 18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser ..... 49¢
Nickel, 100 mesh ..... 51½¢
Silicon, 100 mesh ..... 26¢
Solder powder, 100 mesh..8½¢ plus metal
Stainless steel, 302, minus 100 mesh...75¢
Tin, 100 mesh ..... 90¢
Tungsten metal powder, 98%-99%, any quantity, per lb..... $3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb. $2.65
Under 100 lb $2.90

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	18.60
Chicago, f.o.b.	17.50
New England, del'd	19.75
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, del'd	17.83
Swedeland, Pa., f.o.b.	16.90
Buffalo, del'd	18.75
Ashland, Ohio, f.o.b.	15.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	16.75
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birmingham, del'd	15.00

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Carloads, Per 1000

No. 1, Ohio $64.00
First quality, Pa., Md., Ky., Mo., Ohio 70.00
First quality, New Jersey 75.00
Sec. quality, Pa., Md., Ky., Mo, Ohio 64.00
Sec. quality, New Jersey 59.00
No. 2, Ohio 56.00
Ground fire clay, net ton, bulk.... 10.00

Silica Brick

Pennsylvania and Birmingham ...$70.00
Chicago District and Alabama 79.00
Silica cement, net ton (Eastern)... 12.00
East Chicago 13.00

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Plymouth Meeting, Chester $59.00

Magnesite Brick

Standard, Balt. and Chester $81.00
Chemically bonded, Baltimore 70.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk $44.50
Domestic, f.o.b. Chewelah, Wash., in bulk 24.00
in sacks 28.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest; add 10¢; Missouri Valley; add 20¢..$11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.47	$5.73	$5.82	$4.78	$5.68	$4.82	$4.55	$4.83	$5.53	$8.34	$8.44	$9.88	$9.95
New York	4.71	5.72[1]	6.11	5.03	5.86	5.06	4.75	5.02	5.57	8.40	8.50	9.92	10.02
Boston	4.76	5.63[12]	6.16[12]	4.76	6.73	5.11	4.82	4.98	5.63	8.62	8.72	9.98	10.08
Baltimore	4.31	....	5.71	4.76	....	4.76	4.68	4.81	5.51	....	....	....	....
Norfolk	4.80	....	....	5.20	....	5.05	5.05	5.10	5.90	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee	4.429	5.279[1]	5.829	4.529	5.629[5]	4.779	4.579	4.579	5.279	8.379	8.479	9.629	9.729
Cleveland	4.25‡	4.95	5.78	4.52	5.00	4.60†	4.65	4.40	5.10	8.33	8.43	9.30	9.49
Buffalo	4.25	5.10	6.00	4.70	5.65[5]	4.95	4.40‡	4.40‡	5.10	8.05	8.15	9.30	9.40
Detroit	4.35	5.20	6.02	4.72	5.63	4.88†	4.77	4.50	5.22	8.50	8.60	9.73	9.78
Cincinnati	4.51	5.19	5.74	4.74	5.70	4.95	4.79	4.75	5.45	....	....	....	....
St. Louis	4.58	5.43[1]	5.87	4.68	5.82	4.88	4.73	4.73	5.47	8.57	8.67	9.82	9.92
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
St. Paul	4.63	5.48[1]	5.88[2]	4.73[7]	....	4.93[7]	4.78[7]	4.78[7]	5.91[6]	....	....	....	....
Omaha	4.868	6.118[1]	6.468	5.168	....	5.418	5.218	5.218	5.918	....	....	....	....
Indianapolis	4.553	5.324	5.874	4.653	5.753	4.903	4.703	4.703	5.403	....	....	....	....
Birmingham	4.45[11]	....	5.65	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.04	....	....	....	....
Memphis	4.82[11]	5.87	6.37	5.02[11]	....	5.17[11]	4.97[11]	4.97[11]	6.12	....	....	....	....
New Orleans	*4.98[11]	6.29[1]	....	5.18[11]	....	5.33[11]	*5.03[11]	*5.13[11]	6.29[6]	....	....	....	....
Houston	5.30	....	6.60	5.25	....	5.35	5.15	5.30	6.80	9.40[17]	9.20[17]	10.35[17]	10.45[17]
Los Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7.35[14]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
San Francisco	5.40[8]	6.65	6.85	5.75[8]	....	5.50	5.20	5.05	7.50[10]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
Seattle	5.45[4]	7.25[2]	6.85	5.60[4]	....	5.60[4]	5.25[4]	5.45[4]	7.45[14]	....	8.55[16]	....	11.15[16]
Portland	5.30[4]	7.10[2]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) 1000 to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

‡ Add 35¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37.50	38.00	38.50	.....
Birmingham	32.88-35.88	33.38-36.38	.....	.....	.....
Buffalo	38.00-39.50*	38.00-40.00*	38.50-40.50*	.....	.....
Chicago	35.50	36.00	36.50	37.00	.....
Cleveland	35.50-41.00*	36.00-41.50*	36.50-42.00*	.....	.....
Duluth	36.00	36.50	37.00	37.50	.....
Erie	35.50	36.00	36.50	37.00	.....
Everett	.....	45.00	45.50	.....	.....
Granite City	36.50	37.00	37.00	.....	.....
Neville Island	36.00	36.50	36.50	37.00	.....
Provo	36.00	36.50	.....	.....	.....
Sharpsville	36.00	36.50	36.50	37.00	.....
Steelton	37.00	.....	.....	.....	42.00
Struthers, Ohio	36.50	.....	.....	.....	.....
Swedeland	41.00	41.50	42.00	42.50	.....
Toledo	35.50	36.00	36.50	37.00	.....
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00
Youngstown	36.00	36.50	36.50	37.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.30	.....	.....	.....	.....	47.30
Brooklyn	Bethlehem	3.30	40.30	40.80	41.30	41.80	.....
Cincinnati	Birmingham	5.36	38.24-41.25	38.74-41.74	.....	.....	.....
Jersey City	Bethlehem	2.02	39.02	39.52	40.02	40.52	.....
Los Angeles	Provo	6.53	42.53	43.03	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	38.06-43.56*	38.56-44.06*	39.06-44.56*	39.56	.....
Philadelphia	Bethlehem	1.84	38.84	39.34	39.84	40.34	.....
Philadelphia	Swedeland	1.11	42.11	42.61	43.11	43.61	.....
Philadelphia	Steelton	2.38	39.38	.....	.....	.....	44.38
San Francisco	Provo	6.53	42.53	43.03	.....	.....	.....
Seattle	Provo	6.53	42.53	43.03	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	37.25	37.75	37.75	.....	.....

* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight. Republic Cleveland pig iron prices quoted in error last week. Currently quoted Cleveland prices prevailed in the preceding week.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$45.50; f.o.b. Buffalo—$46.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous $50.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, $56.04. High phosphorous charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	173.00
Delivered Pittsburgh	151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.00	8.25	8.80
Ton lots	9.00	9.60	11.50
Less ton lots	9.40	10.00	11.90

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.06% max. C. 0.06% P, 90% Mn	23.00	24.10	24.70
0.10% max. C	22.50	23.60	24.20
0.15% max. C	22.00	23.10	23.70
0.30% max. C	21.50	22.60	23.20
0.50% max. C	21.00	22.10	22.70
0.75% max. C, 7.00% max. Si	18.00	19.10	19.70

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	7.40
Ton lots	8.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	7.65
Ton lots	8.65
Less ton lots	9.05

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $73.00 f.o.b. Keokuk, Iowa; $73.75 f.o.b. Niagara Falls; $70.75, f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	18.50	19.85	21.60
97% Si, 1% Fe	18.00	20.25	22.00

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si. 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	4.80	5.05	5.25
Ton lots	5.80	6.40	6.70
Less ton lots	6.20	6.80	7.10

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	....	....
50% Si	8.80	9.30	9.50
75% Si	11.20	11.50	12.25
80-90% Si	12.70	13.00	13.75
90-95% Si	14.35	14.65	15.35

Ferrochrome (65-72%Cr, 2% *max.* Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	25.00	25.40	26.00
0.10% C	24.50	24.90	25.50
0.15% C	24.00	24.40	25.00
0.20% C	23.75	24.15	24.25
0.50% C	23.50	23.90	24.00
1.00% C	23.00	23.40	23.50
2.00% C	22.50	22.90	23.00
65-69% Cr, 4.9% C	17.60	18.00	18.15
62-66% Cr. 4-6% C. 6-9% Si	18.60	19.00	19.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	11.10	11.35	11.45
Ton lots	12.00	12.90	13.50
Less ton lots	12.40	13.30	13.90

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chrominum contained, lump sie, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	18.70	19.10	19.25
Ton lots	19.90	21.20	22.00
Less ton lots	20.60	21.90	22.70

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	23.00	23.40	23.50
Ton lots	24.35	25.00	26.20
Less ton lots	25.35	26.00	27.20

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	91.00	92.50	93.75
0.50% max. C	87.00	88.50	89.75
9.00% min. C	87.50	89.00	91.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	17.60	18.35	20.50
Less ton lots	18.60	19.35	21.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	16.75	17.25	19.30
Ton lots	18.85	19.70	21.45
Less ton lots	19.85	20.70	22.45

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr. 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	17.25	18.35	20.30
Less ton lots	18.00	19.10	21.05

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.05	16.15	18.10
Less ton lots	15.80	16.90	18.85

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.50
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2A_5	$1.30
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b Langeloth, Washington, Pa., Per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti	$1.32
Less ton lots	$1.35
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$142.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton	$65.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	6.90¢
Ton lots	7.40¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	37.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed on 50 lb and over

No. 1	93¢
No. 6	63¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15—17%, B 0.90—1.15%, Si 2.5—3.0% Al 1.0—2.0%.

Ton lots, per pound	8.0¢